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# Environmental Projects: Volume 1

## Polychlorinated Biphenyl (PCB) Abatement Program Final Report

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Goldstone Deep Space Communications Complex

**JPL**

Jet Propulsion Laboratory  
California Institute of Technology  
Pasadena, California

**NASA**

National Aeronautics and  
Space Administration



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June 1987

To: Recipients of JPL Publication 87-4, "Environmental Projects:  
Volume 1, Polychlorinated Biphenyl (PCB) Abatement Program,  
Final Report

Subject: Replacement of Above-Mentioned Volume 1

The Jet Propulsion Laboratory (JPL) is publishing a series of reports describing several environmental projects in various stages of development at the Goldstone Deep Space Communications Complex. Enclosed is a reissued copy of Volume 1. The reissued version of this volume more closely conforms with JPL publication standards and replaces the copy previously sent to you. Please return the first copy of Volume 1 to:

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Additional volumes in this series of environmental projects at the Goldstone Complex are in process and will be issued in the future.

A handwritten signature in black ink, appearing to read "L. R. Lunine".

L. R. Lunine, Manager  
Foothill Documentation  
Section 641



# Environmental Projects: Volume 1

## Polychlorinated Biphenyl (PCB) Abatement Program

### Final Report

Goldstone Deep Space Communications Complex



Jet Propulsion Laboratory  
California Institute of Technology  
Pasadena, California



National Aeronautics and  
Space Administration

The work described in this publication was carried out under the direction of the Jet Propulsion Laboratory, California Institute of Technology, and was supported by the National Aeronautics and Space Administration.

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## ABSTRACT

The Goldstone Deep Space Communications Complex (GDSCC), located in the Mojave Desert about 45 miles north of Barstow, California, and about 150 miles northeast of Pasadena, is part of the National Aeronautics and Space Administration's (NASA) Deep Space Network, one of the world's largest and most sensitive scientific telecommunications and radio navigation networks. The Goldstone Complex is managed, technically directed, and operated for NASA by the Jet Propulsion Laboratory (JPL) of the California Institute of Technology in Pasadena, California.

Six, large, parabolic dish antennas, at sites called Deep Space Stations, are located at the GDSCC. Some of the ancillary electrical equipment at these Deep Space Stations, particularly transformers and power capacitors, were filled with stable, fire-retardant, dielectric fluids that contained substances called polychlorobiphenyls (PCBs).

Because the Environmental Protection Agency has determined that PCBs are environmental pollutants toxic to humans, all NASA Centers have been asked to participate in a PCB-abatement program. Under supervision of JPL's Office of Telecommunications and Data Acquisition, a two-year long PCB-abatement program has eliminated PCBs from the Goldstone Complex.

Thus, the Goldstone Deep Space Communications Complex is a major NASA facility that has abided by NASA guidelines and has eliminated the hazards of PCB contamination.

## ACKNOWLEDGMENTS

Thanks are expressed to the following individuals for their assistance and cooperation in the successfully completed polychlorobiphenyl-abatement program carried out at the Goldstone Deep Space Communications Complex:

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## GLOSSARY

|        |   |
|--------|---|
| DDT    | dichloro-diphenyl-trichloroethane               |
| DSCC   | Deep Space Communications Complex               |
| DSN    | Deep Space Network                              |
| DSS(s) | Deep Space Station(s)                           |
| EPA    | Environmental Protection Agency                 |
| ESLS   | Equipment Survey Log Sheets                     |
| ETI    | Electro-Test, Inc.                              |
| GCF    | Ground Communications Facility                  |
| GDSCC  | Goldstone Deep Space Communications Complex     |
| GE     | General Electric Company                        |
| HEF    | high efficiency (antenna)                       |
| JPL    | Jet Propulsion Laboratory                       |
| NASA   | National Aeronautics and Space Administration   |
| NOAA   | National Oceanic and Atmospheric Administration |
| NOCC   | Network Operations Control Center               |
| OFC    | oil fuse cutout (switch)                        |
| PCB    | polychlorobiphenyl(s)                           |
| R&D    | research and development                        |
| STS    | Space Transportation System (Space Shuttle)     |
| STDN   | Space Tracking and Data Network                 |
| TDA    | Telecommunications and Data Acquisition (JPL)   |
| TSCA   | Toxic Substance Control Act                     |

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## SECTION I

### INTRODUCTION

In 1929, a group of chemicals known as polychlorinated biphenyls (polychlorobiphenyls, PCBs) was introduced to American industry. Because of their high-temperature stability, fire-retardancy, lubricity, and high electrical resistance, mixtures of PCBs found worldwide use in industry as plasticizers for plastics, heat-transfer fluids, and as insulating and cooling media in transformers and power capacitors.

During the last three decades, however, many materials and chemicals that originally were thought to be harmless and to have beneficial social and industrial uses, have been discovered to be hazardous or toxic when released into the environment.

PCBs are prime examples of such extremely useful but environmentally hazardous materials. Because of the potential deleterious effects of PCBs, the National Aeronautics and Space Administration (NASA) now is engaged in PCB-abatement programs at its various NASA Centers. This reports deals with the successful PCB-abatement program at the Goldstone Deep Space Communications Complex (GDSCC). The Goldstone Complex is managed, technically directed, and operated for NASA by the Jet Propulsion Laboratory (JPL) of the California Institute of Technology in Pasadena, California.

#### A. THE ENVIRONMENTAL PROBLEM WITH POLYCHLOROBIPHENYLS (PCBs)

The chemical and physical properties that determine both the useful and hazardous aspects of the PCBs lie rooted in a substance called biphenyl. It is a colorless, solid hydrocarbon made up of 12 carbon atoms arranged into two, interconnected, hexagonal rings. Except for the two carbon atoms that take part in the connection between the two hexagons, each of the remaining 10 carbon atoms of biphenyl has a hydrogen atom attached (Figure 1). This particular arrangement of atoms endows biphenyl with great heat and chemical stability.

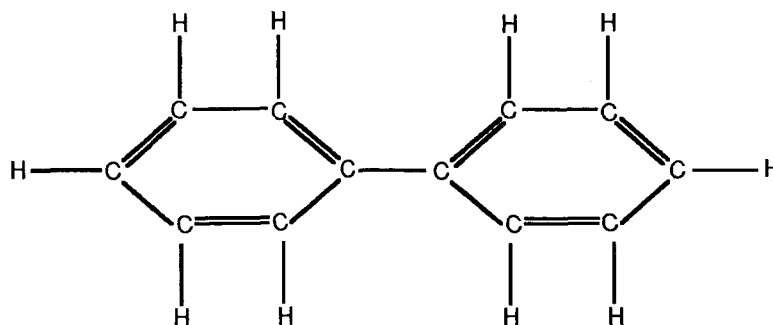


Figure 1. Chemical Structure of Biphenyl (C<sub>12</sub>H<sub>10</sub>)



Because biphenyl is an extremely stable material, with a relatively low melting temperature and high boiling point, it found widespread use as a good heat-transfer medium.

Through rather simple chemical reactions, any, or all of the hydrogen atoms of biphenyl can be replaced by chlorine atoms. Replacement of two or more hydrogen atoms by chlorine atoms gives rise to materials called polychlorobiphenyls (Greek: "poly" means many). Figure 2 depicts a typical PCB in which seven of biphenyl's 10 hydrogen atoms have been replaced by chlorine atoms.

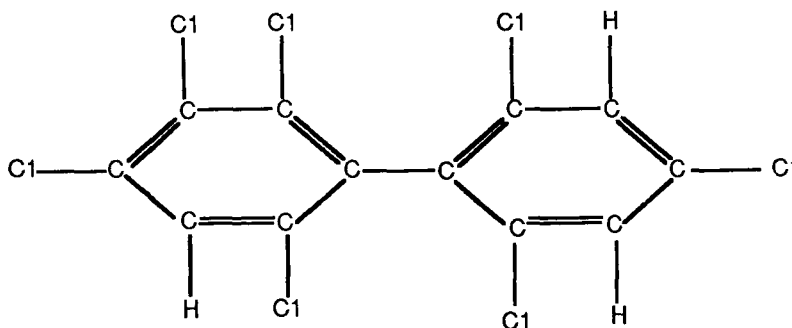


Figure 2. Chemical Structure of a Polychlorobiphenyl ( $C_{12}H_3Cl_7$ )

In 1929, mixtures of PCBs began to be produced by Monsanto under its tradename of AROCLOR. Because these combinations of PCBs are extremely stable, high-boiling materials with low flammability (fire retardancy), high heat capacity, and low electrical conductivity, they universally were used as dielectric insulating media in electrical equipment, in general, and in transformers and power capacitors, in particular.

But the very physical and chemical characteristics that make PCBs so desirable for use in electrical equipment also allow them to persist for long periods of time in the environment without undergoing any appreciable degradation. In this way, the environmental persistence of the PCBs resembles that of the chlorinated pesticides such as dichloro-diphenyl-trichloroethane (DDT).

The first report of environmental contamination by PCBs was published in 1966. Since then, PCBs have been shown to concentrate in animal food chains, to give rise to toxic effects in humans, and to be carcinogenic in rodents.

## SECTION II

### NATIONAL AERONAUTICS AND SPACE ADMINISTRATION CENTERS AND THE PCB PROBLEM

Although the production of PCBs in the United States was discontinued in 1977, the problem remained of what to do with the numerous, already existing, PCB-filled transformers and power capacitors that had been manufactured before 1977 and still were in operation? It is a problem of particular concern to the diverse facilities of NASA with their large quantities of electrical power equipment.

In June 1983, NASA issued a "NASA PCB Risk Assessment Manual."\* In the Manual, Billie J. McGarvey, Director, Facilities Engineering and Computer Management Division, wrote:

"The U.S. Environmental Protection Agency (EPA), under Section 6(e)(2) of the Toxic Substance Control Act (TSCA, PL94-469), has banned the manufacture of new equipment containing PCBs and established stringent requirements on the continued use and disposal of existing equipment containing PCBs. These regulations apply to all NASA Centers and field installations.

"Accordingly, NASA developed guidelines for the management of equipment containing PCBs. Proper management of equipment containing PCBs will require that all equipment suspected of containing PCBs be inventoried to identify the equipment containing PCBs and to determine what actions will be required to minimize the risks associated with the continued use of this equipment. To assist in this effort, this NASA PCB Risk Assessment Manual has been prepared."

As a NASA Center, JPL began to comply with both the EPA rules and the NASA Risk Assessment Guidelines concerning PCBs. In mid-1984, the JPL Office of Telecommunications and Data Acquisition (TDA) began a detailed investigation to determine to what extent PCB-contaminated equipment existed at the Goldstone Complex.

---

\*"NASA PCB Risk Assessment Manual," prepared for the NASA Real Property Management Branch, Washington, D.C., by Engineering-Science, Fairfax, Virginia in association with DeLeuw, Cather & Company, Washington, D.C., June 1983.

### SECTION III

#### THE GOLDSTONE DEEP SPACE COMMUNICATIONS COMPLEX (GDSCC)

The Goldstone Deep Space Communications Complex is located in a natural, bowl-shaped depression in the Mojave Desert about 150 miles northeast of JPL in Pasadena, California, and about 45 miles north of Barstow, California (Figure 3).

The 52-square mile Complex lies within the western part of the Fort Irwin Military Reservation on land NASA leases from the U.S. Army (Figure 4). The GDSCC is a self-sufficient, working community with its own roads, airstrip, cafeteria, electrical power, and telephone systems and is equipped to conduct all necessary maintenance, repairs, and domestic support services.

The GDSCC is part of the NASA Deep Space Network (DSN), one of the world's largest and most sensitive scientific telecommunications and radio navigation networks. The primary purpose of the DSN is to support the tracking of both manned and unmanned spacecraft missions and to provide instrumentation for radio and radar astronomy in the exploration of the solar system and the universe.

Goldstone is one of three Deep Space Communications Complexes (DSCCs) located on three continents: at Goldstone in Southern California's Mojave Desert; in Spain, near Madrid; and at Tidbinbilla, in Australia, near Canberra. Because these three DSCCs are approximately 120 degrees apart in longitude, a spacecraft always is in view of one of the DSCCs as the Earth rotates on its axis (Figure 5).

The Network Operations Control Center (NOCC), which controls and monitors the DSN, is located at JPL in Pasadena. A Ground Communications Facility (GCF) of the DSN operates to link together the NOCC at JPL and the three DSCCs.

Six, large, parabolic dish antennas, at sites called Deep Space Stations (DSSs), are located at Goldstone: four DSSs are operational, one is devoted to research and development (R&D) activities, and one has been deactivated. There also are four, similar, operational DSSs in Spain and in Australia. Thus, the NASA DSN consists of a worldwide network of 12 operational DSSs. A seventh parabolic dish antenna at Goldstone is operated by the National Oceanic and Atmospheric Administration (NOAA).

It was because these antenna-sites, their control facilities, and other ancillary installations at the Goldstone Complex make liberal use of transformers and power capacitors that the JPL Office of Telecommunications and Data Acquisition (TDA) began its survey to detect PCB-containing equipment at the Goldstone DSCC.

3-2



Figure 3. Geographic Location of Goldstone Deep Space Communications Complex in California



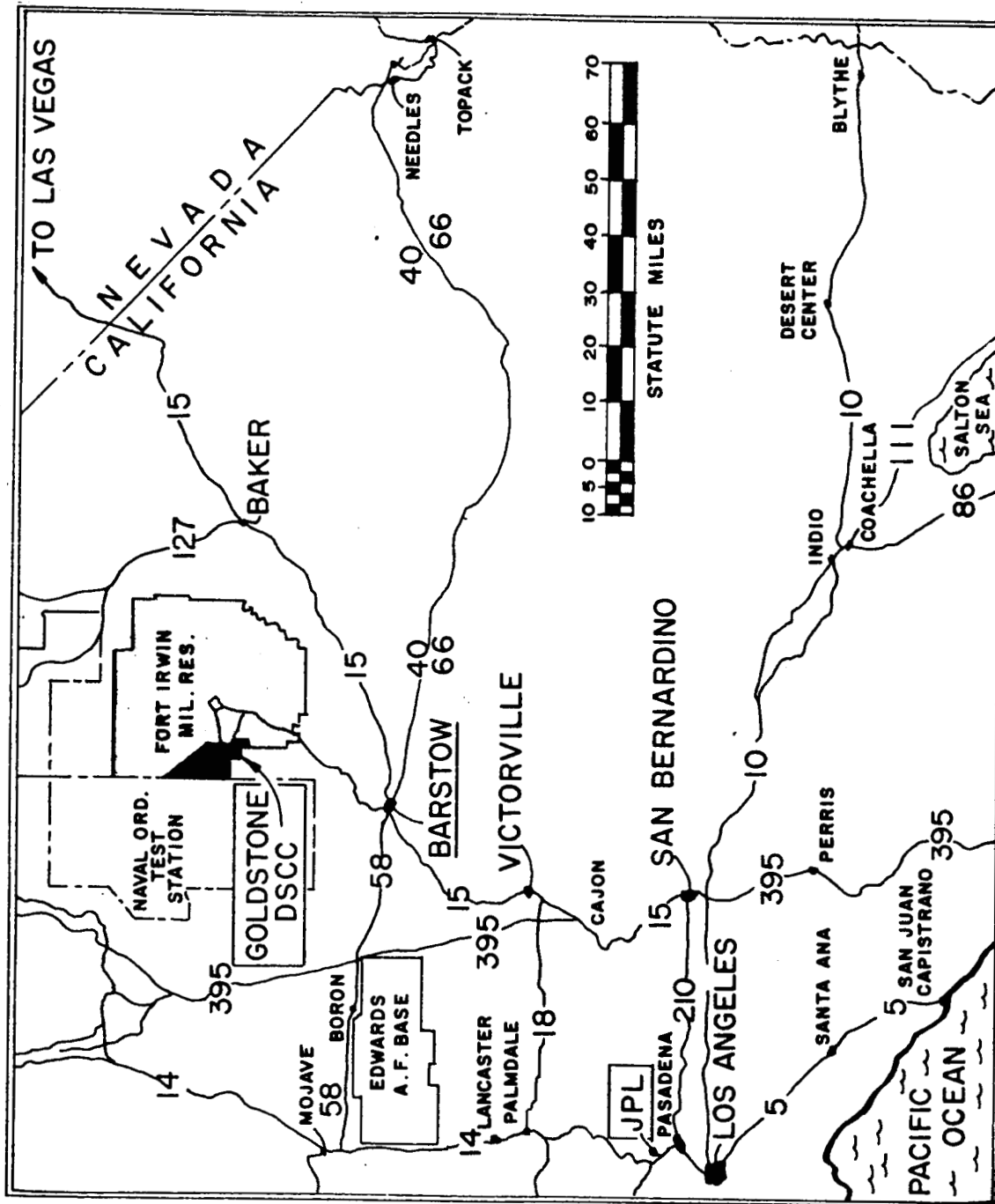


Figure 4. Geographic Relationship of the Goldstone Deep Space Communications Complex to JPL in Pasadena

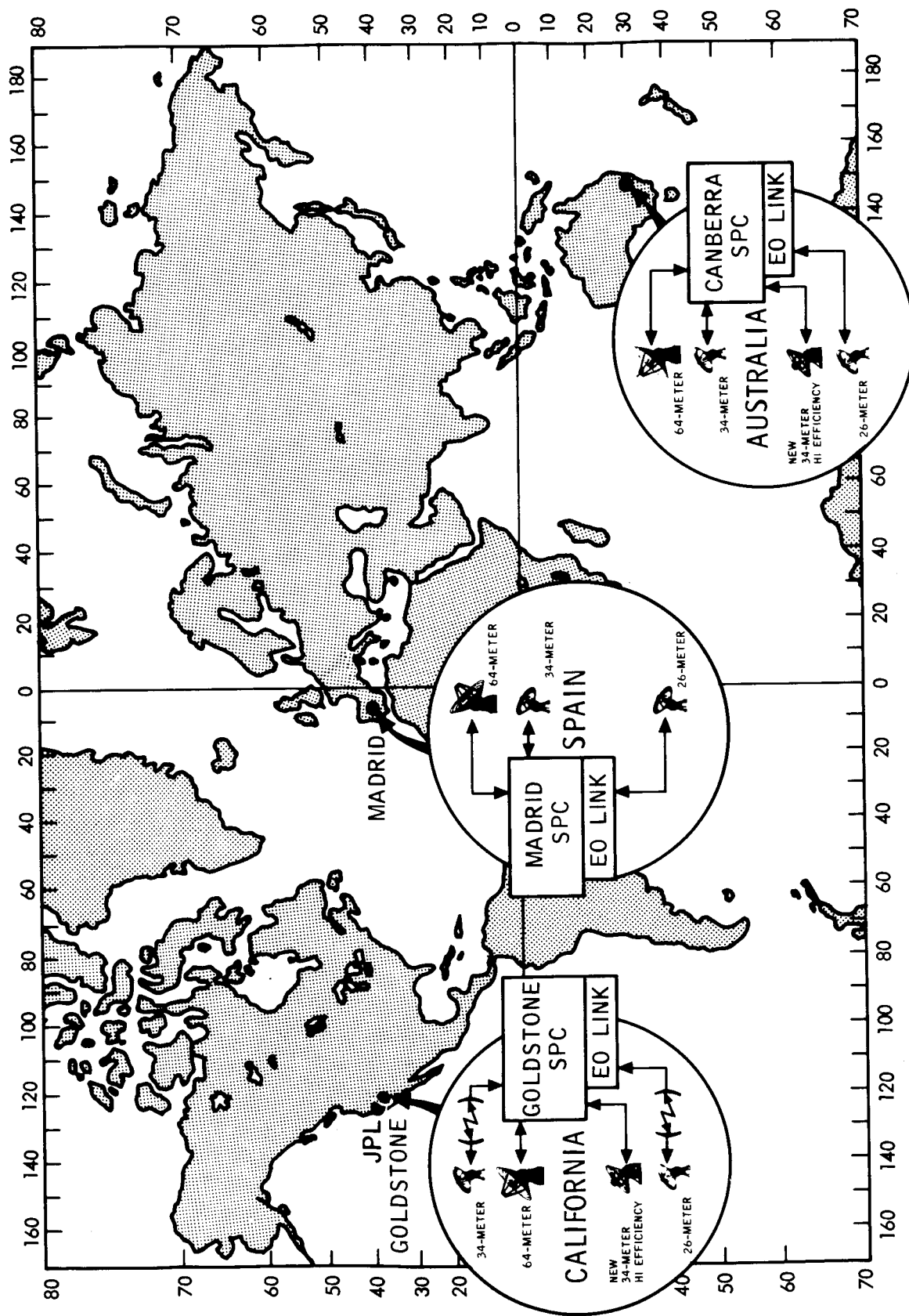


Figure 5. The Three-Continent NASA Deep Space Network as it Existed in 1986

The following is a brief historical description of the six NASA/JPL antenna-sites at Goldstone involved in the TDA survey to identify PCB-containing equipment (Figure 6).

A. GOLDSTONE OPERATIONAL DEEP SPACE STATIONS (DSSs)

1. DSS 12 (Echo Station)

Originally built in 1959, the 26-meter (85 ft) antenna first was used in 1960 in support of the Echo Project, an experiment to transmit voice communications Coast-to-coast by bouncing radio signals off the reflective Mylar surface of a passive balloon-type satellite. In 1978, the antenna was extended to 34-meters (111.5 ft).

2. DSS 14 (Mars Station)

Built in 1966, the 64-meter (210 ft) antenna, standing more than 234 ft tall, permitted the DSN's transmitter power and receiver sensitivity to increase 6.5 times compared to that of a 26-meter antenna. It also extended the range of the DSN into deep space by 2.5 times. The 64-meter parabolic dish is to be extended to 70 meters (230 ft) in time to be ready for the Voyager 2 spacecraft's encounter with the planet Neptune in 1989.

3. DSS 15 (Uranus Station)

Built in 1984, this latest antenna-addition at the Goldstone DSCC is a 34-meter (111.5 ft), high-efficiency (HEF) antenna that first was used to support the Voyager 2 spacecraft's encounter with the planet Uranus in January 1986.

4. DSS 16 (Apollo Station)

This 26-meter (85 ft) antenna, built in 1965 by the NASA Goddard Space Tracking and Data Network (STDN) to support the manned Apollo missions to the Moon, was transferred to the DSN in October 1984. The antenna is used to support satellites in both low- and high-Earth orbits as well as STS (Space Shuttle) missions.

B. RESEARCH AND DEVELOPMENT DEEP SPACE STATION

1. DSS 13 (Venus Station)

The 26-meter (85 ft) antenna at the Venus Station, originally was located at Echo Station, and was moved here in 1962. It first was used in a radar astronomy study of the planet Venus. New systems and equipment are thoroughly tested here for performance and reliability before they operationally are introduced into the DSN.

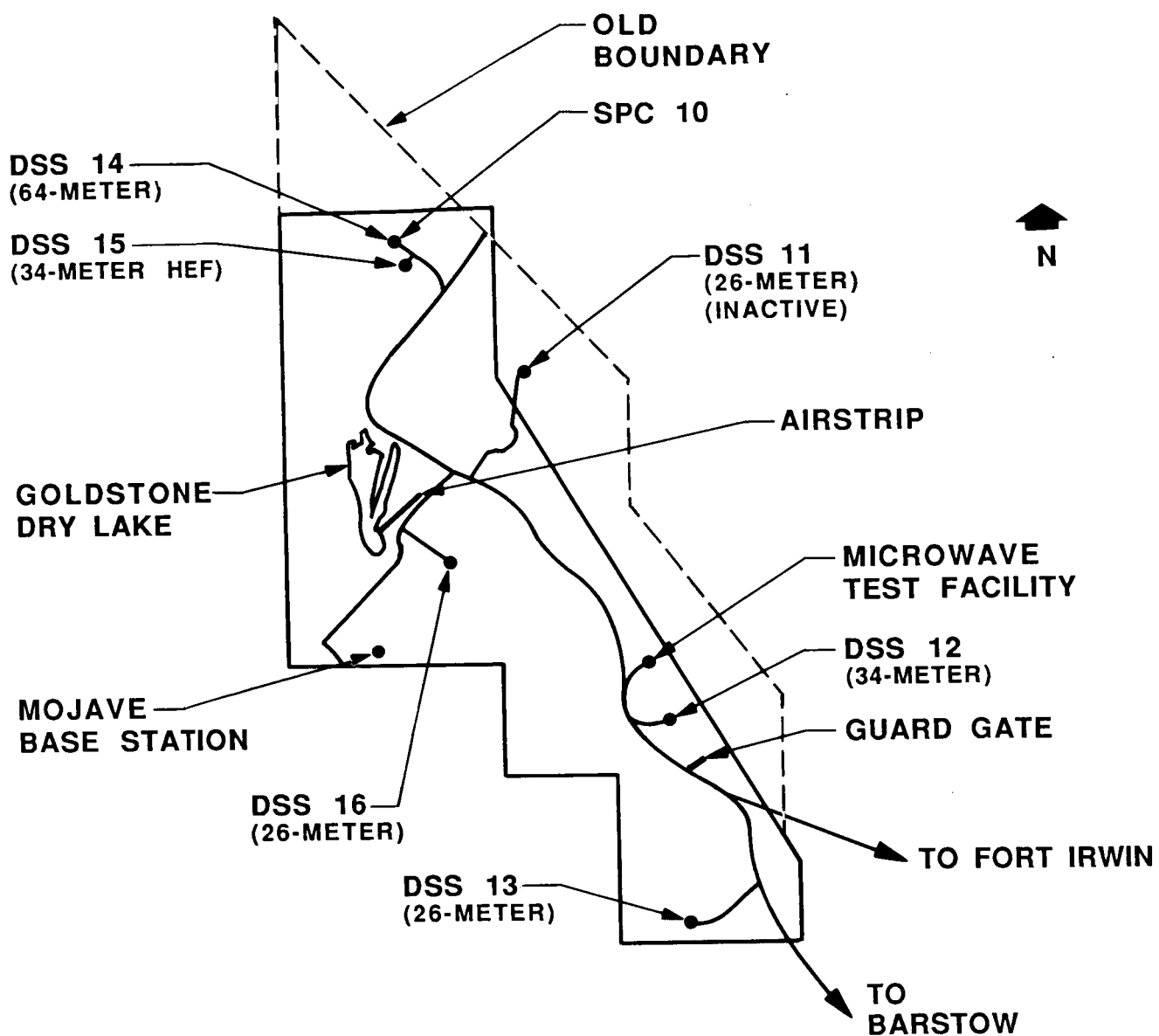


Figure 6. Schematic M-p of the Goldstone DSCC Showing Locations of the Six NASA Deep Space Stations (DSSs)



C. DEACTIVATED DEEP SPACE STATION

1. DSS 11 (Pioneer Station)

Built in 1958, the 26-meter (85 ft) antenna first was used in support of the Pioneer 3 spacecraft mission. The antenna was deactivated in 1981, and in 1985, the Pioneer antenna-site was designated a National Historical Landmark by the U.S. Department of Interior. In 1986, the Pioneer antenna-site was returned to the U.S. Army and is no longer located on the Goldstone complex.

D. NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)  
MOJAVE BASE STATION

In addition to the six NASA/JPL DSSs the Goldstone Complex also has a 12-meter (40 ft) antenna at the Mojave Base Station, located near DSS 16, the Apollo Station. This antenna now is operated by NOAA.

## SECTION IV

### PCB-ABATEMENT PROGRAM AT THE GOLDSTONE DEEP SPACE COMMUNICATIONS COMPLEX

In August 1984, following enactment of the Toxic Substance Control Act (TSCA, PL94-469) and publication of the "NASA PCB Risk Assessment Manual," the JPL Office of Telecommunications and Data Acquisition (TDA) began an investigation of the extent of PCB-contamination at the Goldstone DSCC.

The TDA work at the Goldstone DSCC proceeded in the following two stages:

- (1) A detailed survey was conducted at the Goldstone DSCC of all facilities and electrical equipment that possibly might be contaminated with PCB.
- (2) All electrical equipment that contained PCBs were identified and their PCB-concentrations were determined. Based upon their PCB-concentrations, PCB-containing electrical equipment is divided into the following three categories (Table 1):
  - (a) Electrical equipment with PCB-concentrations greater than 500 parts per million (ppm) is known as PCB-equipment. It either must be provided with protection to contain any future PCB spill (see Section IV-C, Option B, below), or be disposed of and replaced with compatible equipment that contained no PCBs. Disposed equipment had to be removed to an EPA-approved, hazardous-waste disposal site. Until time of their disposal, all PCB-equipment were labelled with a yellow-colored, warning sticker.

After due consideration, and life-cycle cost studies, the TDA Office decided it was both safer and more economical to remove and replace all PCB-equipment with new, compatible, non-PCB equipment.

- (b) Electrical equipment with PCB-concentrations between 50 and 500 ppm is known as PCB-contaminated equipment and for economic reasons was to receive a special retrofilling treatment (see Section IV-C below). A yellow-colored, warning sticker was attached to all PCB-contaminated equipment until such time that its PCB-concentration was decreased to less than 50 ppm. At that time, the yellow sticker was replaced with a blue-colored sticker that certified the equipment was non-PCB in that it contained <50 ppm PCB.
  - (c) Electrical equipment with PCB-concentrations below 50 ppm is known as non-PCB equipment and is acceptable to be used as is. This equipment was labelled with a blue-colored sticker to indicate it had been tested and found to be safe (non-PCB).

Table 1. Identification of Goldstone DSCC Equipment with Respect to PCB-Contamination

| Equipment        | Total Number of Units | PCB Equipment <sup>a</sup><br>(>500 ppm) | PCB-Contaminated Equipment <sup>b</sup><br>(50 to 500 ppm) | Non-PCB Equipment <sup>c</sup><br>(0 to 50 ppm) |
|------------------|-----------------------|--|--|---|
| Transformer      | 158 <sup>d</sup>      | 7  | 14   | 137   |
| Switchgear       | 37 <sup>e</sup>       | 34                                       | 0  | 3   |
| Capacitor        | 54 <sup>e</sup>       | 51                                       | 0  | 3   |
| Hydraulic System | 6                     | 0  | 0  | 6   |
| Oil Filter Pump  | 1 <sup>d</sup>        | 1  | 0  | 0   |

<sup>a</sup>This PCB-equipment either was discarded (from storage) or replaced.

<sup>b</sup>This PCB-contaminated equipment was retrofilled.

<sup>c</sup>This non-PCB equipment was used as is.

<sup>d</sup>Two transformers (one 30 kVA and one 2000 kVA) and the oil filter pump showed active leakage of PCB-fluid and required immediate cleanup or replacement.

<sup>e</sup>Includes sealed units that could not be opened to be tested. They, therefore, were assumed to be PCB-equipment.

The progress of the PCB-abatement program carried out by the TDA Office is depicted in the Milestone Schedule (Figure 7).

Photographs and schematic maps, that show the appearance and the location, respectively, of the electrical equipment at the Goldstone Complex that was either retrofilled or replaced in the PCB-abatement program, are displayed in Appendix A.

#### A. SURVEY OF THE PCB-PROBLEM

In August 1984, Electro-Test, Inc. (ETI) of San Ramon, California, was selected by the JPL Architects-Engineers (A-E) Services Board to carry out a survey of all Goldstone DSCC facilities and equipment that contained oil-type dielectric fluids. Both JPL and Goldstone DSCC-operating personnel participated in the survey. Equipment Survey Log Sheets (ESLS) were prepared for all equipment that contained a liquid dielectric fluid. A typical ESLS is shown in Figure 8.

#### B. IDENTIFICATION OF PCB-CONTAMINATED EQUIPMENT

Samples of dielectric fluids were taken from each piece of oil-filled equipment and a preliminary analysis determined whether chlorine atoms were present. If positive, an immediate qualitative laboratory test then verified whether the chlorine atoms were due to the presence of PCB. If PCB was present, a quantitative laboratory test then determined the actual level of PCB-contamination, whether the PCB-concentrations were above or below the allowable level of 50 ppm. The results of this identification stage are summarized in Table 1.

Data obtained from this equipment survey and identification then were used to develop a PCB Risk Assessment Program for the Goldstone DSCC. In accordance with NASA guidelines, the TDA Office used the NASA Risk Evaluation Guidelines, Equipment Assessment Forms, Equipment Risk Worksheets, Remedial Alternative Cost Calculation Worksheets, and Remedial Alternative Cost Comparison Worksheets to develop its PCB-abatement program.

#### C. RETROFILLING TREATMENT FOR PCB-CONTAMINATED EQUIPMENT

Following the survey and identification stages of the PCB-containing electrical equipment, the following two options were available to treat the PCB-contaminated equipment (between 50 and 500 ppm):

- (Option A) Drain the equipment of its PCB-containing fluid and replace it with a non-PCB dielectric fluid (mineral oils) until the PCB-concentration of the dielectric fluid within the equipment was below 50 ppm. If this retrofilling operation was carried out, the drained PCB-contaminated fluid had to be removed and transported to an EPA-approved, hazardous-waste disposal site.

| CY   | 1983 | 1984 | 1985 | 1986 | 1987 |
|--|------|------|------|------|------|
| ISSUE OF NASA<br>RISK ASSESSMENT MANUAL  | △    |      |      |      |      |
| SURVEY OF ALL<br>GDSCC FACILITIES  |      | ▣    |      |      |      |
| DEVELOPMENT OF JPL RISK<br>EVALUATION GUIDELINES   |      |      | ▣    |      |      |
| CONTRACTORS ACTIVITIES<br>TO COMPLETION  |      |      | ▣    | ▣    |      |
| PROGRAM CLOSE-OUT AND<br>FINAL REPORT  |      |      |      |      | ▣    |
| <div> <div>PREPARED BY:<br/>G. KROLL</div> <div>DATE:<br/>DEC 1985</div> </div> <div> <div>APPROVED BY:<br/>LEN KUSHNER</div> <div>DATE:<br/>DEC 1985</div> </div> |      |      |      |      |      |

Figure 7. Milestone Schedule for PCB-Abatement Program at GDSCC

PCB CLASSIFICATION DATA

EQUIPMENT TYPE Capacitor, Large 1.1 mfd

SERIAL NO. 35 F245 TNP, Mfg - C.S.I.

NASA I.D. No. None

LOCATION STDN - APOLLO, Stores Annex  
(Behind operations bldg)  
Spare unit, stored on metal  
shelf.

CLASSIFICATION PCB (greater than 500 PPM)

Electro-Test, Inc. Reference No. 5084034, Appendix I, Tab 2, Page 8

JPL Reference 956986

Classification Certified by:

Richard S Rounke  
Richard S. Rounke  
Field Engineer  
Electro-Test, Inc.

Figure 8. A Typical Equipment Survey Log Sheet

(Option B) Do not retrofill the PCB-contaminated equipment, but run the multiple risks of keeping the equipment as it is. The risks of doing so, however, involved taking the following factors and precautions into consideration:

1. Characteristics of the PCB Dielectric Fluid. One must consider the concentration of PCBs in the fluid, the volume of PCB fluid in the equipment, and the physical state of the dielectric fluid (solid or liquid).
2. Spill Control/Cleanup. Spillage of dielectric fluid can be controlled through the presence of dikes or curbs around the equipment to contain all or part of any anticipated spilled dielectric fluid, through location of the equipment indoors or within an enclosure to limit the spread of any dielectric fluid, and through the elimination of any channels or paths that would aid the dispersion and spread of any spilled dielectric fluid.
3. Damage Potential. Potential for damage to the equipment exists if the equipment is outdoors and is not protected from any possible damage from vehicles.
4. Impacts. Consideration must be given to the following diverse impacts: environmental impacts (location of equipment near an area of soil, or near a body of water, or near to a drain that leads to the water); worker impacts (direct exposure to spilled dielectric fluids or to vapors coming from vents located near the spillage); and mission impacts (presence of nearby equipment that is in regular use and that if contaminated in a PCB-spill could abort a mission, and presence of available backup equipment to take over if there is a dielectric-fluid spill from the primary equipment).

After review of Option B risk assessments and alternative cost comparisons, the TDA Office concluded it was safer and more economical to implement Option A (to retrofill the PCB-contaminated equipment with new, non-PCB dielectric fluids). Thus, although it was considered, Option B was not used at all in the PCB-abatement program at the Goldstone DSCC.

Based upon this retrofill/replacement decision, the JPL Procurement Office invited six contractors, experienced in the handling of PCB-contaminated materials, to bid on the work required for the total elimination of all PCB-liquids and PCB-contaminated equipment from the Goldstone DSCC.

#### D. AWARD OF PCB-ABATEMENT CONTRACT

In July 1985, after a competitive-bidding procurement and evaluation phase, a contract was awarded to General Electric (GE), Apparatus and Engineering Services Division, El Monte, California, for the disposal of PCB-equipment and the refilling of all PCB-contaminated material at the Goldstone DSCC.

The first phase of the refilling task, begun by GE in October 1985, consisted of the drainage of the PCB-contaminated dielectric fluids from specified transformers and oil fuse cutout (OFC) switches. The equipment was allowed to drip-drain. Any oil remaining behind was pumped out and each unit was flushed out with new dielectric fluid. After this flush-operation, the equipment was filled with new, non-PCB containing dielectric fluid. Samples then were removed to test both for dielectric characteristics and for PCB contamination. If test-sample analyses indicated the refilled equipment still was PCB-contaminated after the refill, it retained its yellow PCB-warning sticker and the refilling procedure was repeated as many times as necessary to get the equipment down to <50 ppm.

A second phase of the refill task was to reanalyze the equipment for PCB contamination after 90 days of in-service use. This was to determine whether any residual PCB had leached back into the new dielectric fluid. The refill, retest/reanalyze, 90-day in-service-use procedure would be repeated until a non-PCB contamination test (<50 ppm) was achieved. This second phase was completed by GE in February 1986 when all refilled equipment were found to have acceptable levels of PCBs (<50 ppm). At that time, each piece of equipment was provided with a blue-colored sticker (Figure 9) that certified the equipment was safe (non-PCB).

By March 1986, in addition to its refilling activities of Goldstone DSCC equipment, GE completed the refilling of four OFC switches at the Mojave power plant. In April 1986, GE tested 25 additional pieces of equipment at Goldstone and six of these required refilling. This work, accomplished in June 1986, marked the completion of GE's refilling activities at Goldstone.

#### E. REMOVALS AND REPLACEMENTS OF PCB-CONTAMINATED EQUIPMENT

In October 1985, when GE personnel began their PCB-abatement activities at Goldstone, they removed the following PCB-contaminated materials:

- (1) A 2000-kVA transformer.
- (2) Four 55-gallon drums of solid wastes.
- (3) Two 55-gallon drums of liquid wastes.
- (4) Ninety-seven PCB-contaminated drums.



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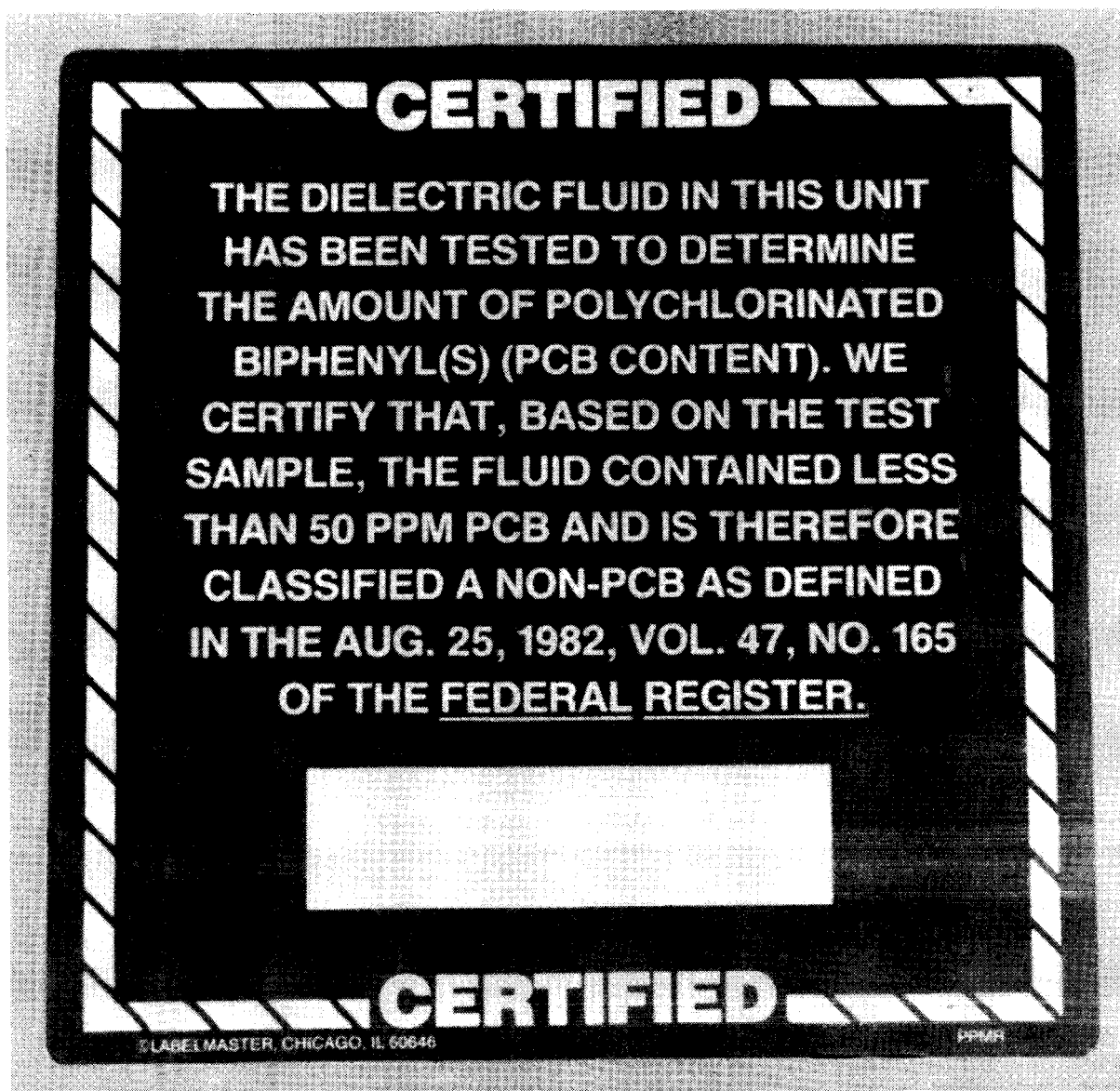


Figure 9. Certification Sticker Attached to Retro-filled Non-PCB Contaminated Equipment

All PCB-equipment and materials to be removed by GE from Goldstone, whether it had been discarded or was being held in storage, first was transported by GE to its EPA-approved hazardous-waste storage facility in Anaheim, California, and then trans-shipped to various EPA-certified, hazardous-waste disposal sites.

As an example of disposal, involving PCB materials rather than equipment, approximately 4,500 gallons of PCB transformer oil were transported from Goldstone by U.S. Pollution Control, Clive, Utah, to its EPA-certified, hazardous-waste disposal facility. Manifests and Disposal Certificates concerning the PCB-equipment and materials removed from Goldstone are presented in Appendix B.

A major task of the PCB-abatement program at Goldstone was the replacement of a 30-kVA transformer at the 9-meter collimation tower at the Apollo/STDN Station. During the initial survey stage, it was found to be leaking PCBs. In February 1986, the transformer was removed along with 2,500 pounds of PCB-contaminated solids and 50 pounds of PCB liquids. The contaminated concrete pad area (approximately 5 X 6 ft), as well as the immediately surrounding soil, were removed in EPA-approved drums. The removed transformer was replaced in March 1986 by a new, larger capacity, more economical, dry-type, 75-kVA transformer placed on a new prefabricated, polymer-concrete pad.

A chronology of GE's PCB-abatement activities at Goldstone is presented in Table 2. General Electric's final report, detailing the PCB-abatement work done at Goldstone, is presented in Appendix C.

#### F. THE TOTAL ELIMINATION OF PCBs AT GOLDSTONE DSCC

The total elimination of PCBs at Goldstone was achieved on March 1, 1987, when eight PCB-containing, Hi-Power transmitter-system capacitors were replaced with non-PCB containing capacitors after long-term delivery delays. Replacement of these remaining eight capacitors was performed by the Goldstone DSCC Maintenance and Operations Contractor.

Thus, on March 1, 1987, based upon the above-described stages of PCB-abatement, the Goldstone DSCC was declared to be free of PCB-contamination. The Goldstone Deep Space Communications Complex, therefore, is a major NASA facility that has abided by NASA guidelines and has eliminated the PCB-contamination problem.

Table 2. Chronology of Contractor's PCB-Abatement Program at GDSCC

| Date          | Activity   |
|---------------|--|
| July 1985     | Contract awarded to Contractor (General Electric (GE), Apparatus and Engineering Services Division, El Monte, California.  |
| October 1985  | GE delivered 100 drums of new, non-PCB containing dielectric fluid, 22 empty drums, and two six packs of nitrogen gas to GDSCC to begin the retrofilling task.   |
| February 1986 | <p>GE removed, for discard, a 2000-kVA PCB transformer, four 55-gallon drums of waste solids, two 55-gallon drums of PCB liquids, 97 contaminated drums, and 4500 gallons of PCB contaminated liquids.</p> <p>Tests completed of all equipment that had been retrofilled 90 days earlier. All units were found to be in the non-PCB category (&lt;50 ppm) and could be used as they were.</p> <p>Removed a 30-kVA transformer located at the 9-meter collimation tower at the Apollo/STDN station. The transformer was leaking PCBs. Along with the transformer, the surrounding soil and concrete pad also were removed for disposal.</p> |
| March 1986    | <p>Completed retrofilling of four oil fuse cutout (OFC) switches at Mojave power plant. Three other OFC switches tested after 90-days service.</p> <p>Removed six containers, each containing 80 pounds of PCB waste materials.</p> <p>Removed three crates containing 57 PCB capacitors.</p>  |
| April 1986    | GE tested samples for PCB content from 25 additional pieces of equipment. Of these, six required retrofilling.   |
| June 1986     | Retrofilling of six pieces of equipment that had tested PCB-contaminated in April 1986.  |
| October 1986  | GE completed its contractual activities.   |
| March 1987    | PCBs had been eliminated from the Goldstone Complex.   |

SECTION V

CERTIFICATION

I hereby certify that all work performed for the elimination of PCB within the Goldstone Complex of the Ft. Irwin military reservation, San Bernardino County, California, as described in this report, was performed in compliance with both the Environmental Protection Agency requirements and provisions of 40 CFR and with the NASA Risk Assessment Manual (June 1983), and in accordance with good engineering practice.

Leonard H. Kushner  
Registered Professional Engineer

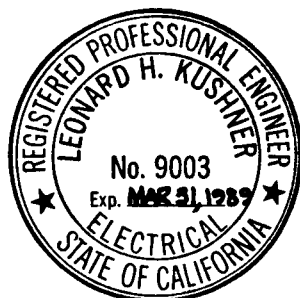
Signature Leonard H. Kushner

Date Signed: March 15, 1987

Registration No. E9003, Electrical  
SF1086, Safety

State: California  
California

Stamp/Seal:



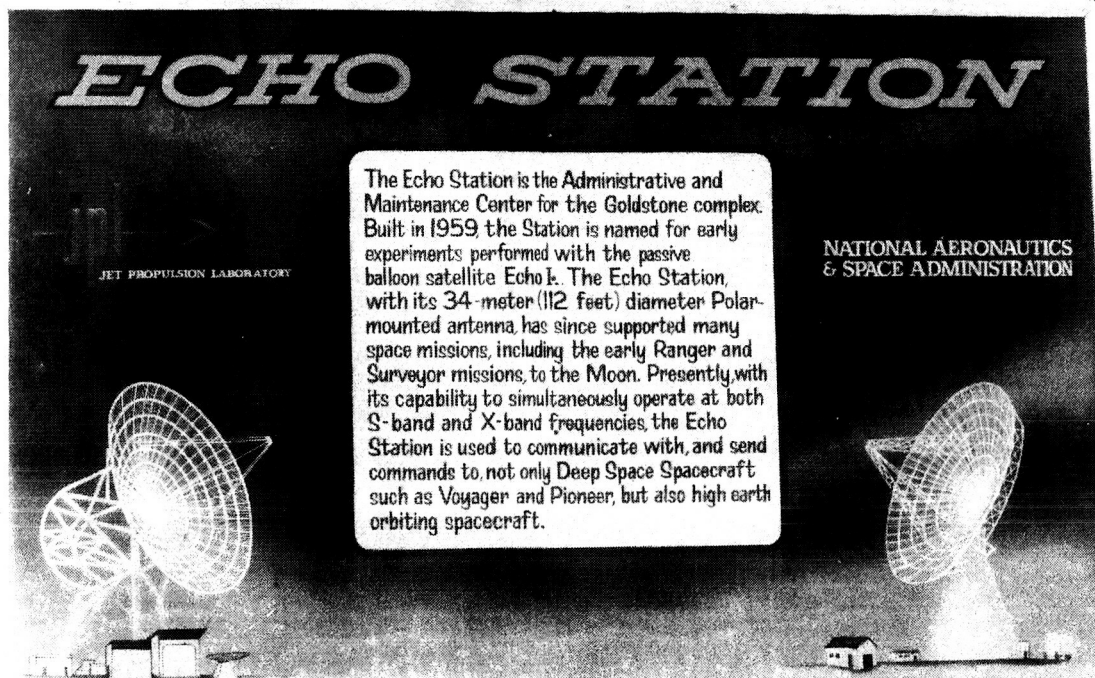
## APPENDIX A

### PHOTOGRAPHS AND LOCATIONS OF ELECTRICAL EQUIPMENT THAT WAS RETROFILLED OR REPLACED DURING THE PCB-ABATEMENT PROGRAM AT THE GOLDSTONE DEEP SPACE COMMUNICATIONS COMPLEX

In this Appendix, each photograph of a piece of Goldstone equipment is designated by a Figure number (e.g., Figure A-34). On the schematic drawings of the various Goldstone sites involved in the PCB-abatement program, an arrow drawn from the Figure number points to the location of that particular piece of equipment.

ECHO STATION  
DSS 12

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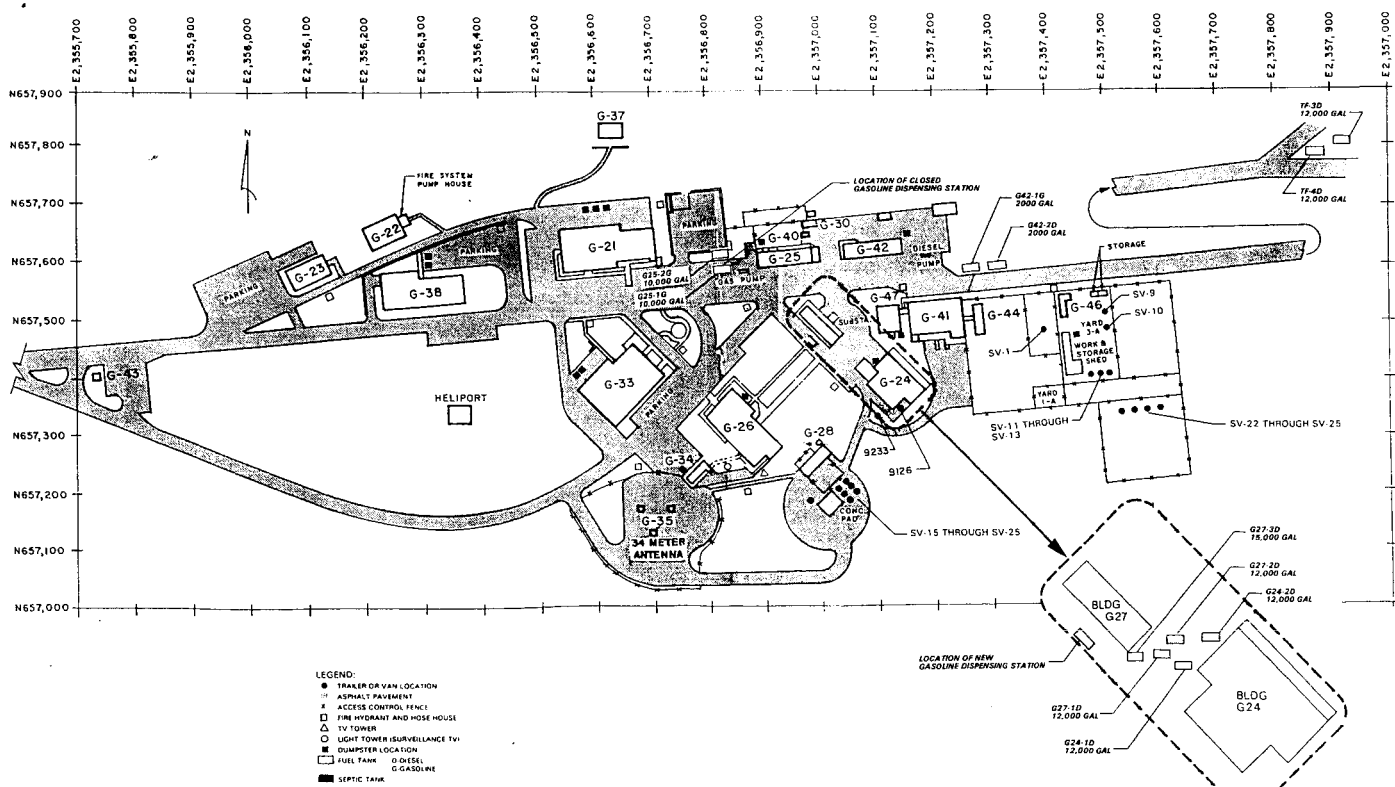
Originally built in 1959, the 26-meter (85 ft) antenna first was used in 1960 in support of the Echo Project, an experiment to transmit voice communications Coast-to-coast by bouncing radio signals off the surface of a passive balloon-type satellite. In 1978, the antenna was extended to 34-meters (111.5 ft).

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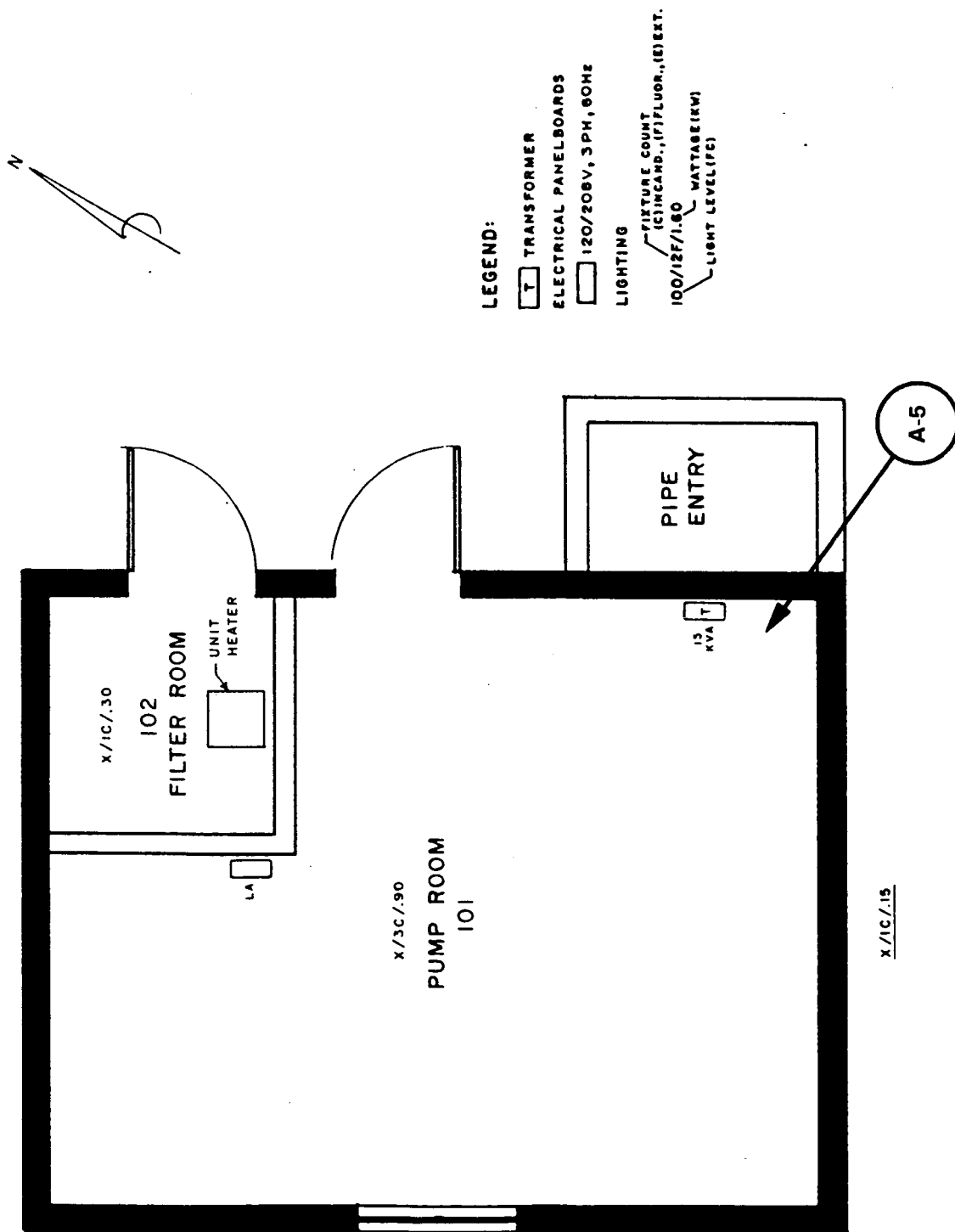


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Figure A-3. Echo Site: Fire Line Pump House (G-22)

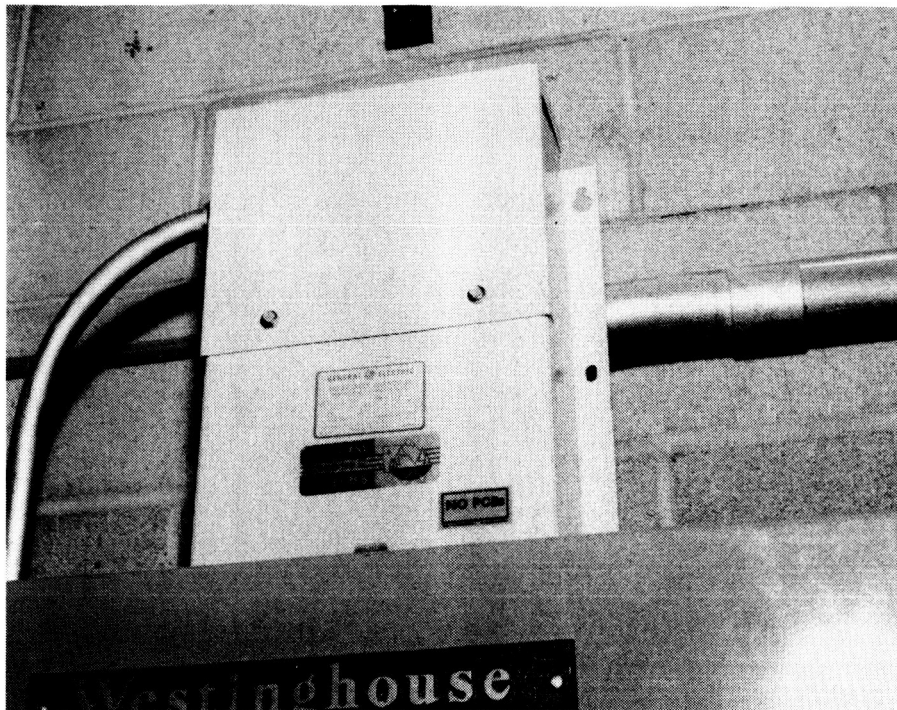


Figure A-4. Power Factor Capacitor: Echo Station,  
Administration and Cafeteria, Bldg. G-21,  
Room 127



Figure A-5. Power Factor Capacitor: Echo Station, Fire  
Line Pump House, Bldg. G-22, Room 101

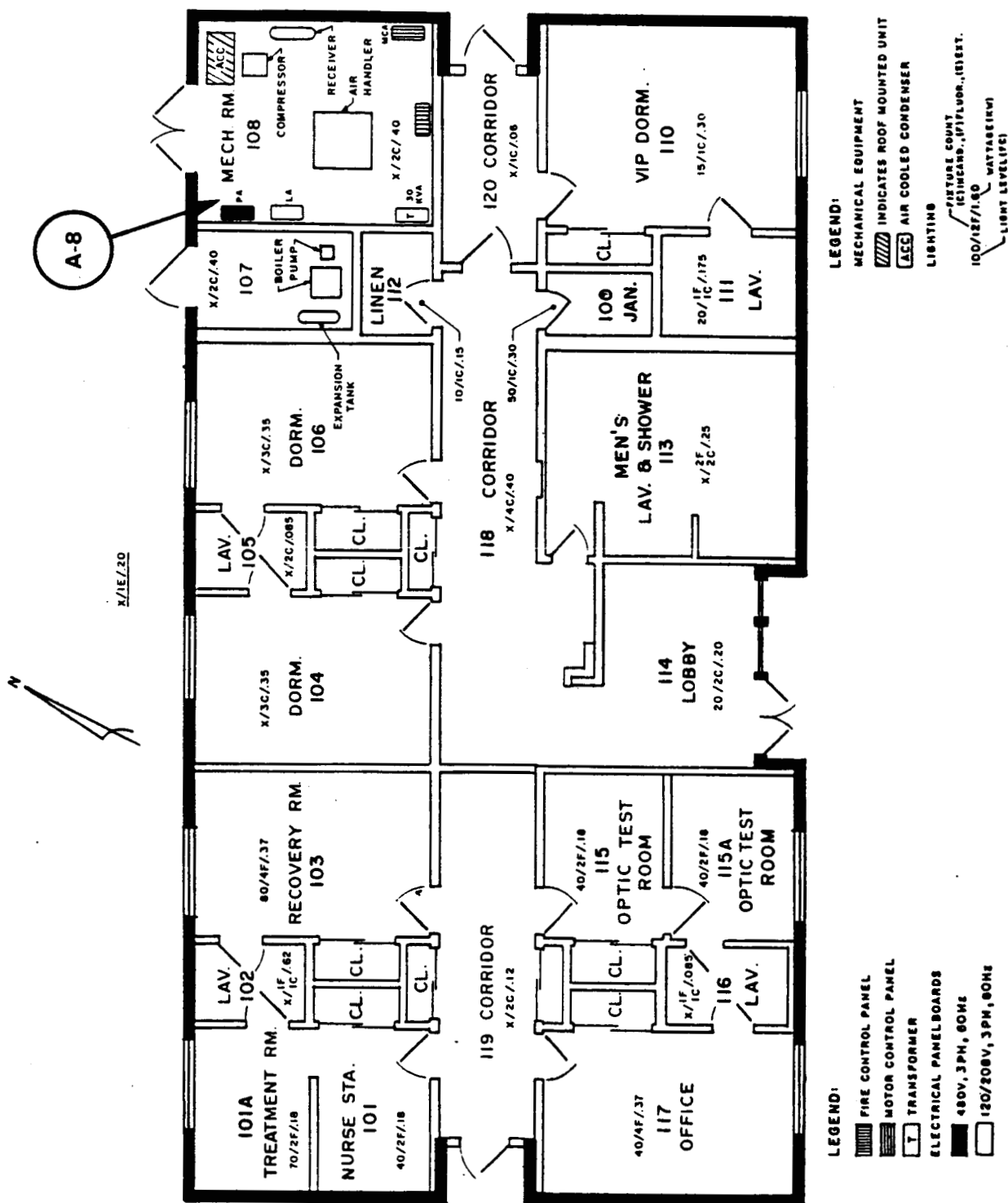


Figure A-6. Echo Site: Dormitory Building (G-23)

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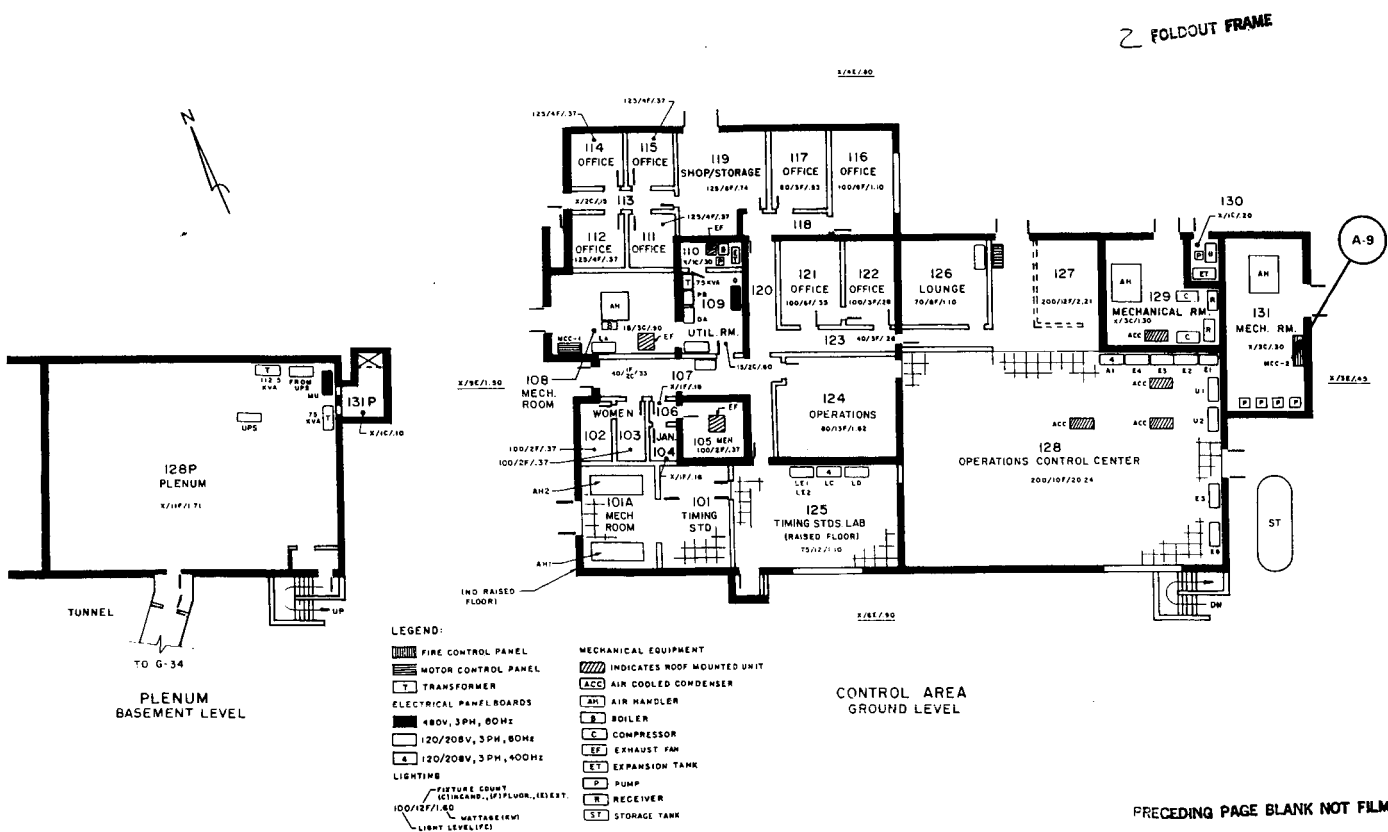


Figure A-7. Echo Site: Control Building (G-26)

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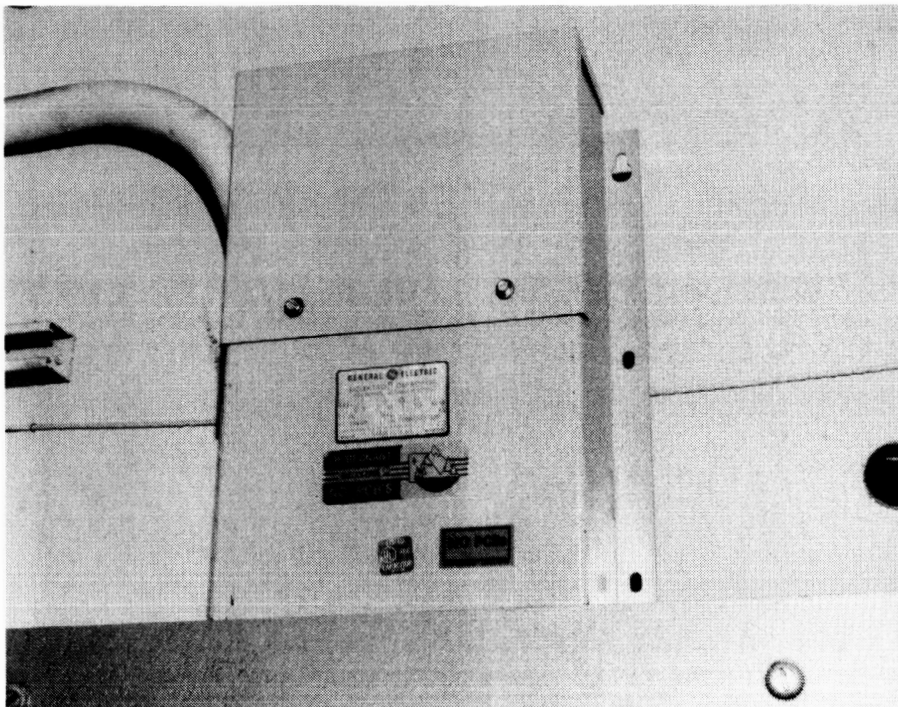


Figure A-8. Power Factor Capacitor: Echo Station,  
Dormitory, Bldg. G-23, Room 108.

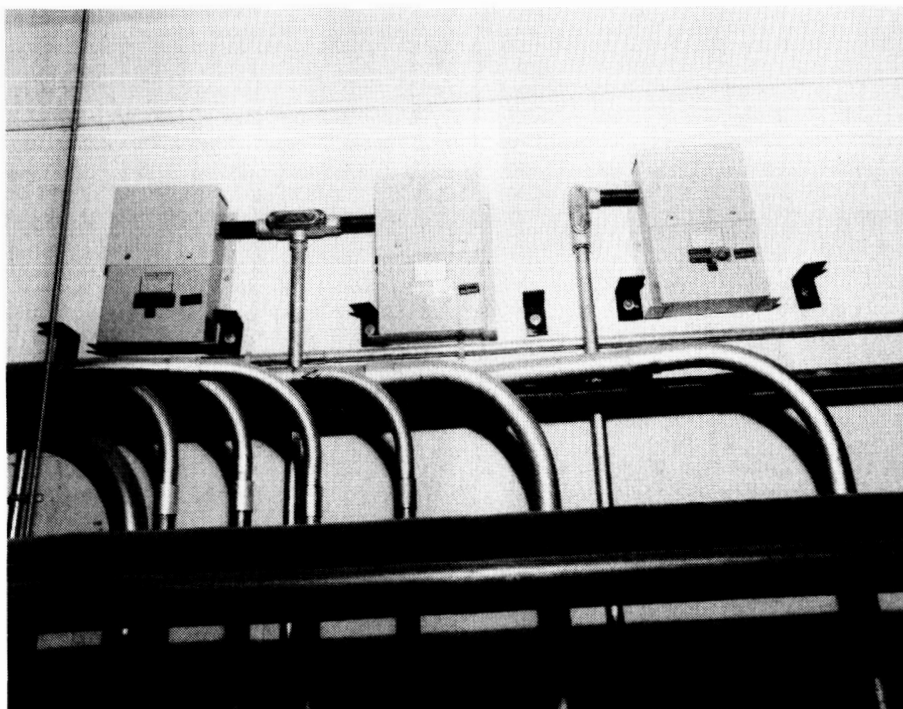


Figure A-9. Power Factor Capacitors: Echo Station,  
Control, Bldg. G-26, Room 131

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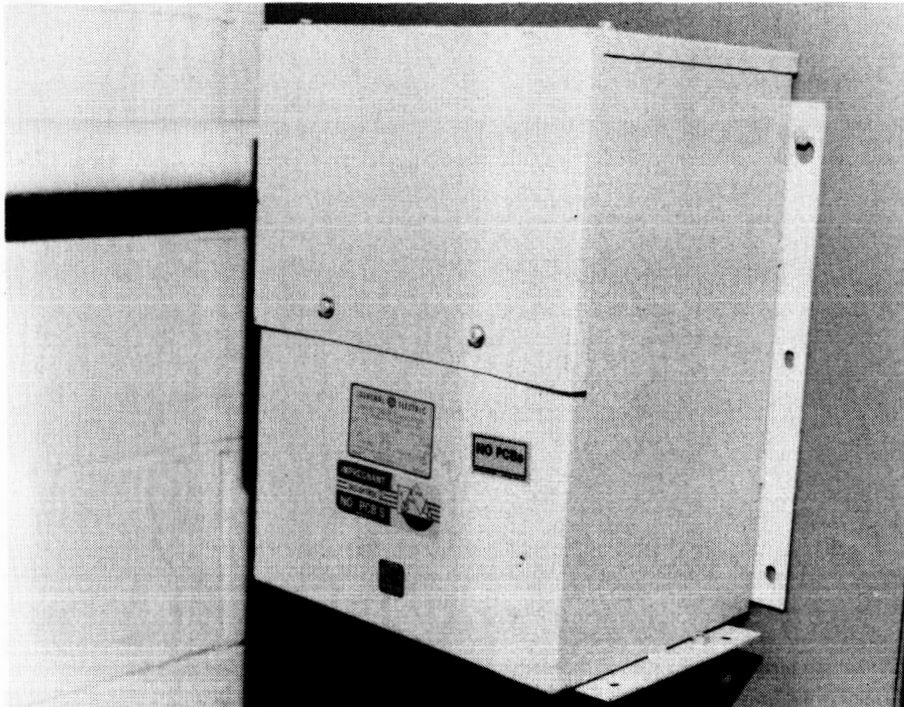


Figure A-11. Power Factor Capacitor: Echo Station,  
Network Laboratory and Maintenance Facility,  
Bldg. G-38, Room 115

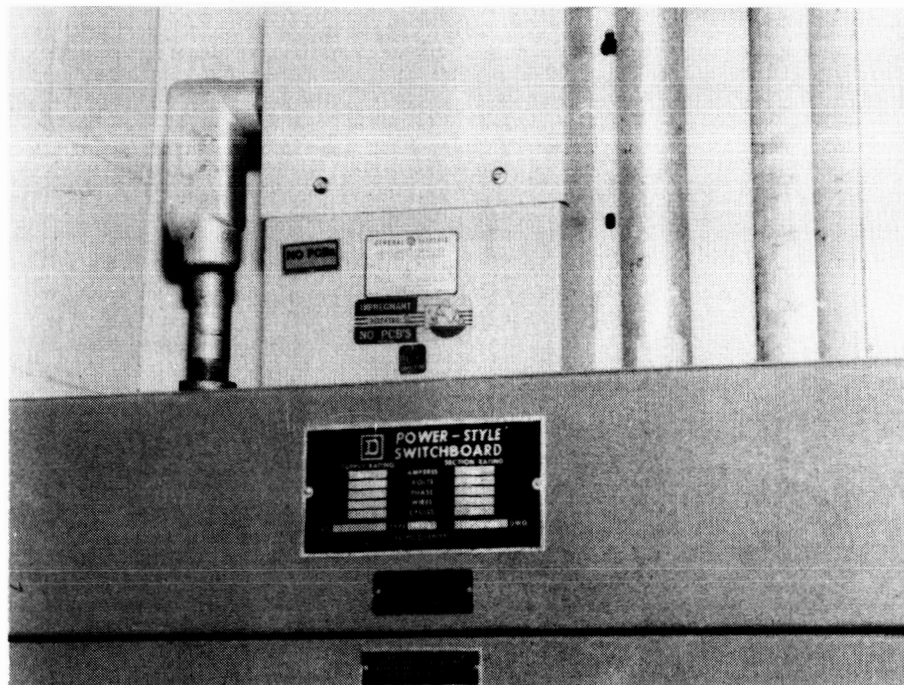
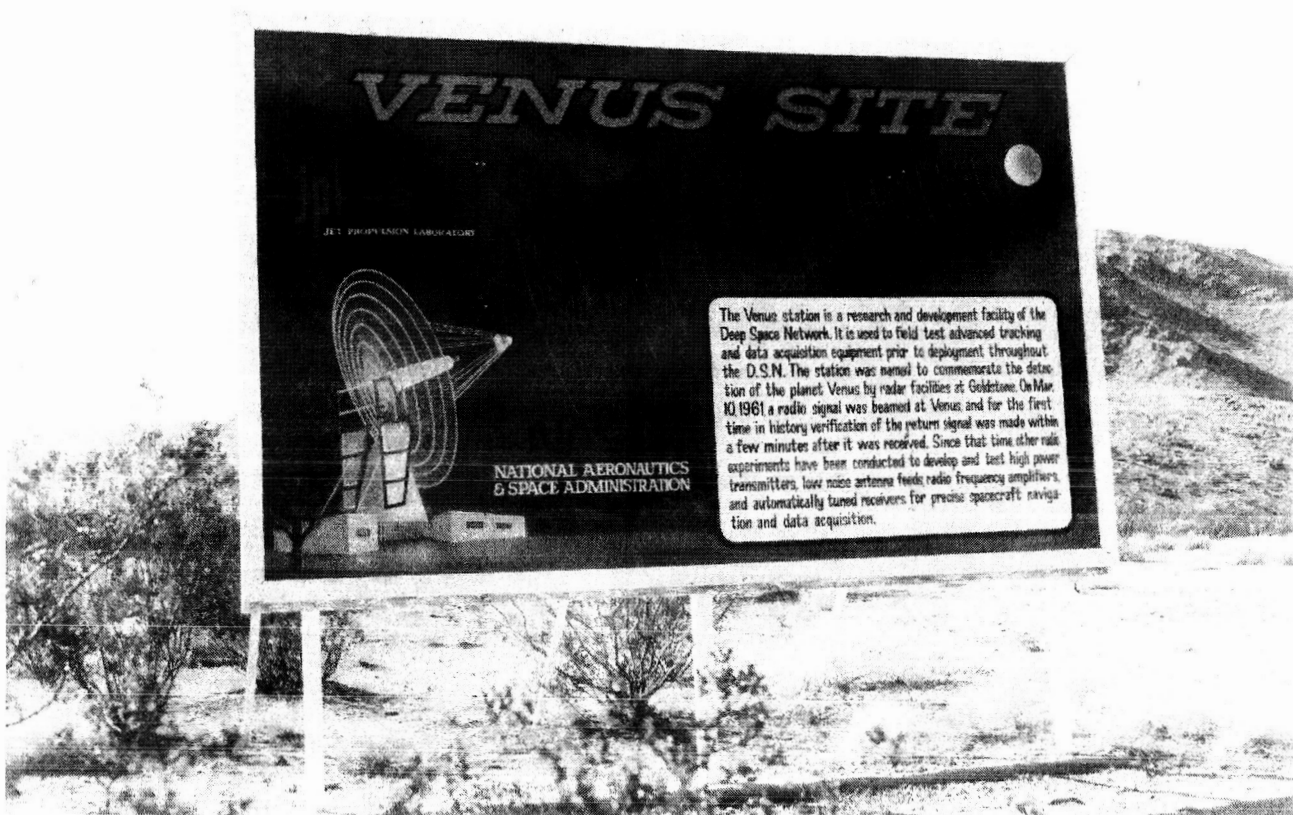


Figure A-12. Power Factor Capacitor: Echo Station,  
Network Laboratory and Maintenance  
Facility, Bldg. G-38, Room 131



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VENUS STATION  
DSS 13



The 26-meter (85 ft) antenna at the Venus Station, originally was located at Echo Station, and was moved here in 1962. It first was used in a radar astronomy study of the planet Venus. New systems and equipment are thoroughly tested here for performance and reliability before they operationally are introduced into the DSN.

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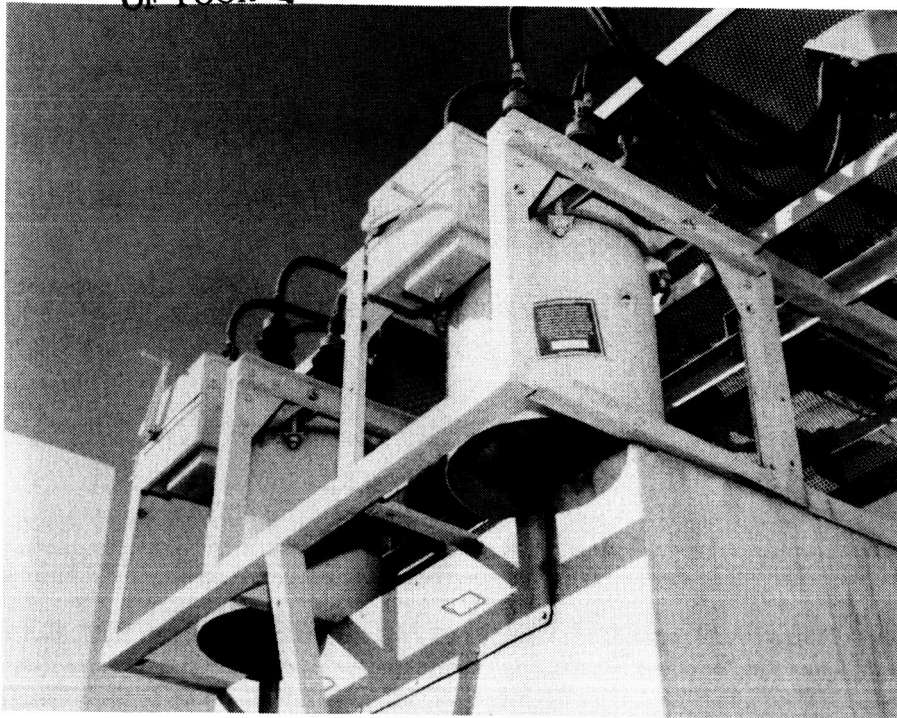


Figure A-14. Motor-Generator Set Capacitors: Venus Site,  
Outside of Bldg. G-53A

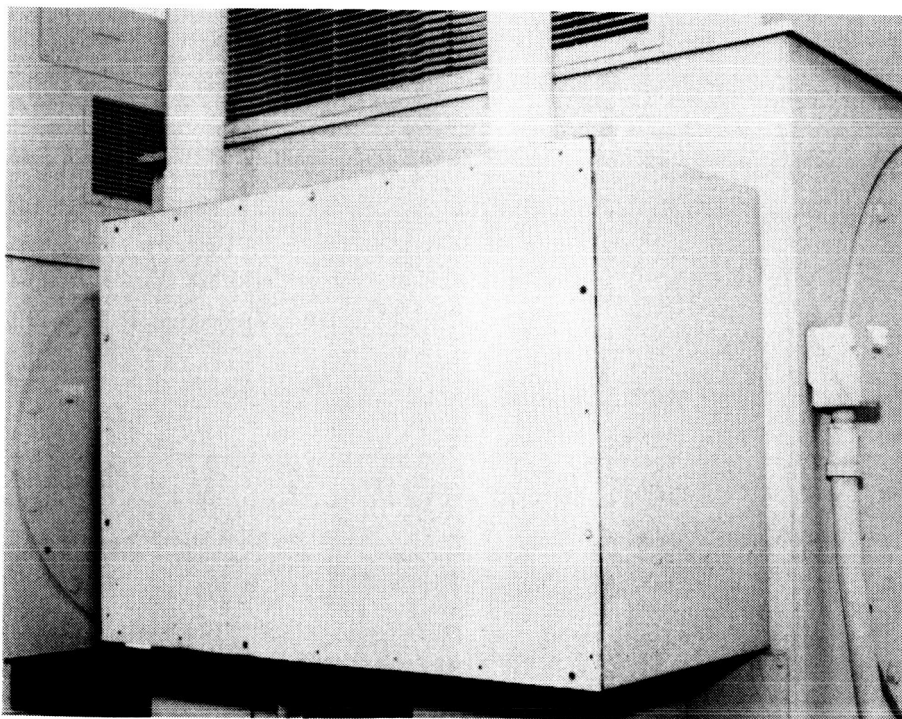


Figure A-15. Motor-Generator Set Input Transformer:  
Venus Site, Outside of Bldg. G-53A

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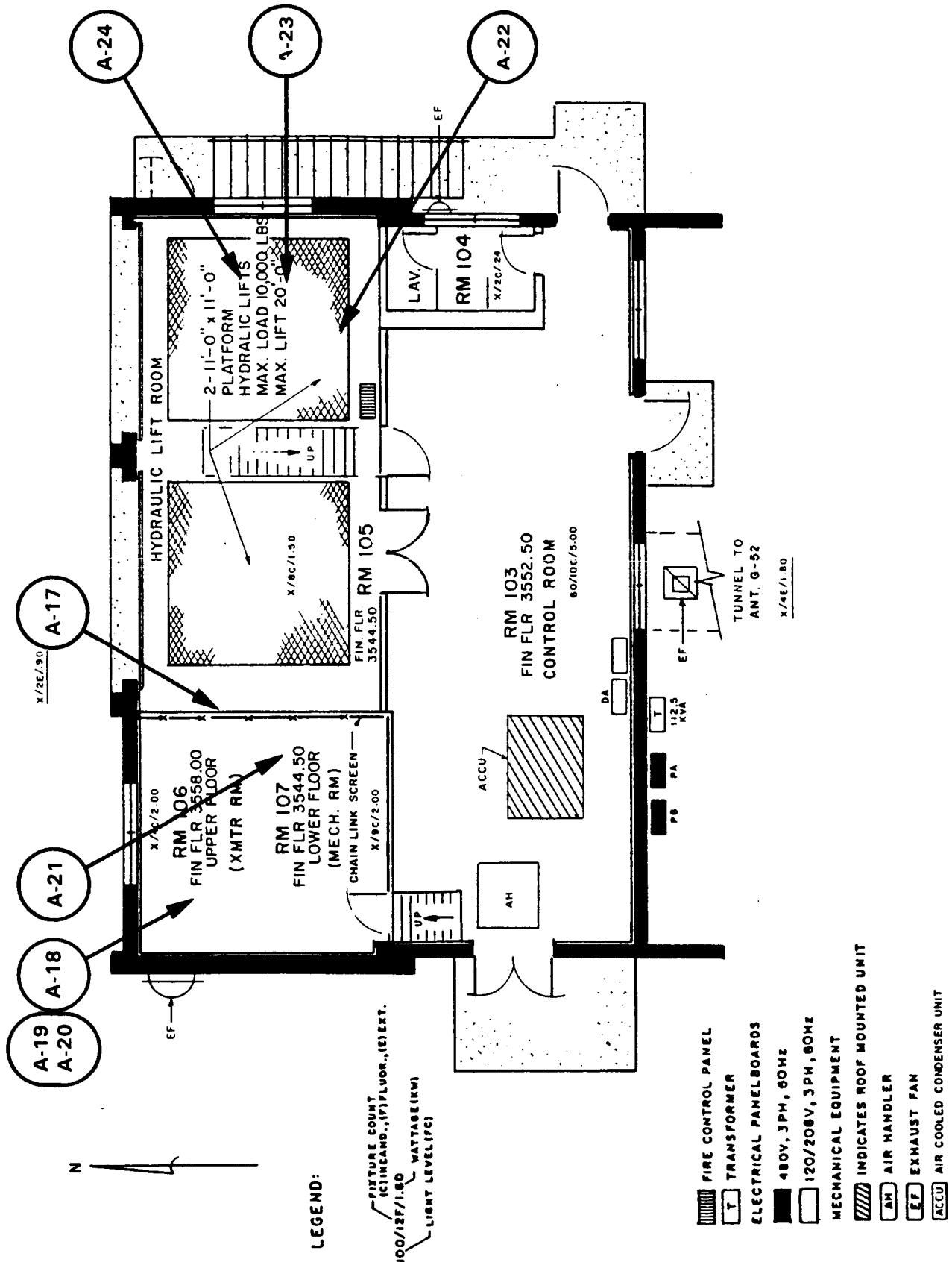


Figure A-16. Venus Site: Transmitter Building (G-53A)

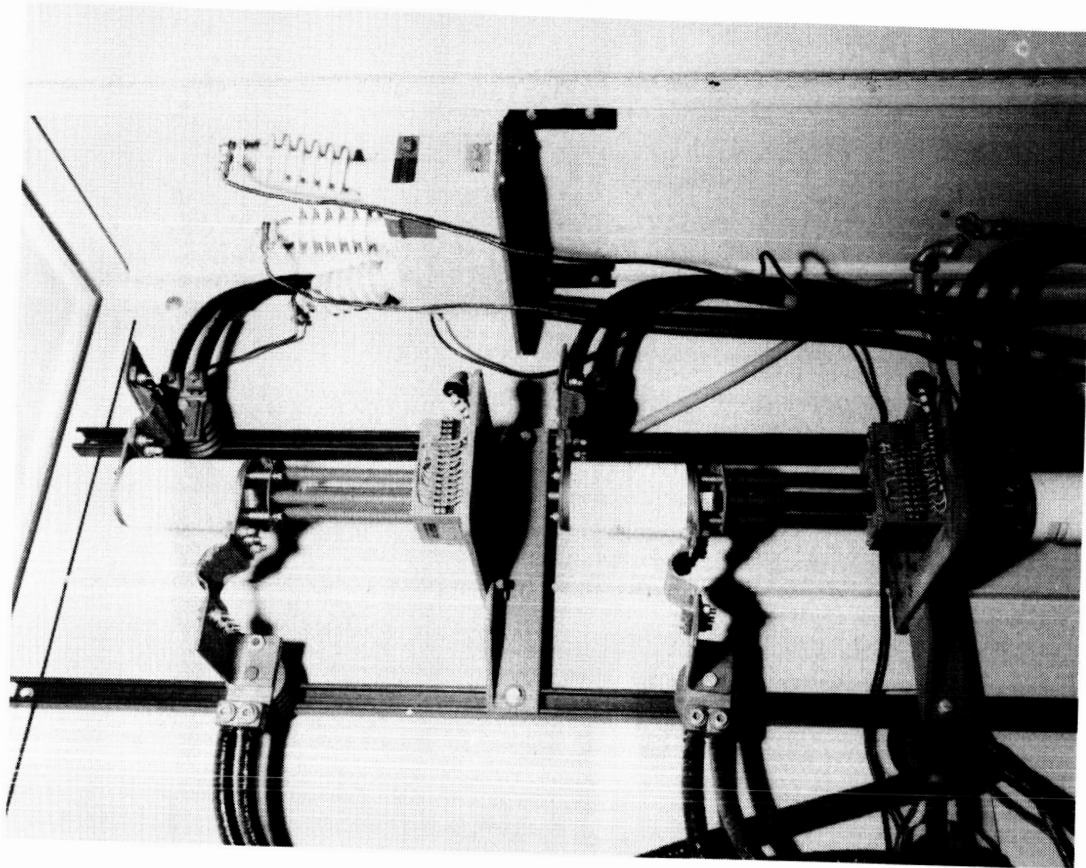


Figure A-18. High-Voltage Capacitor: Venus Site,  
Transmitter, Bldg. G-53A, Room 107

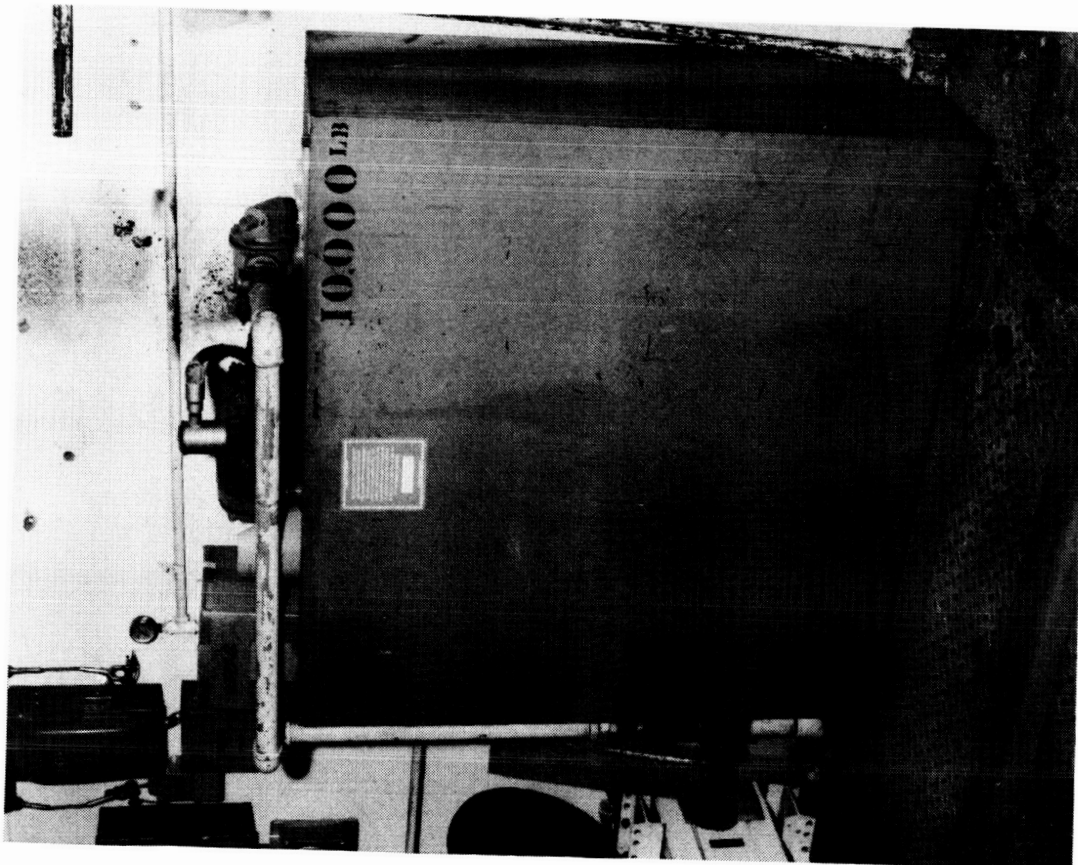


Figure A-17. Hydraulic Hoist Tank: Venus Station,  
Transmitter, Bldg. G-53A, Room 107

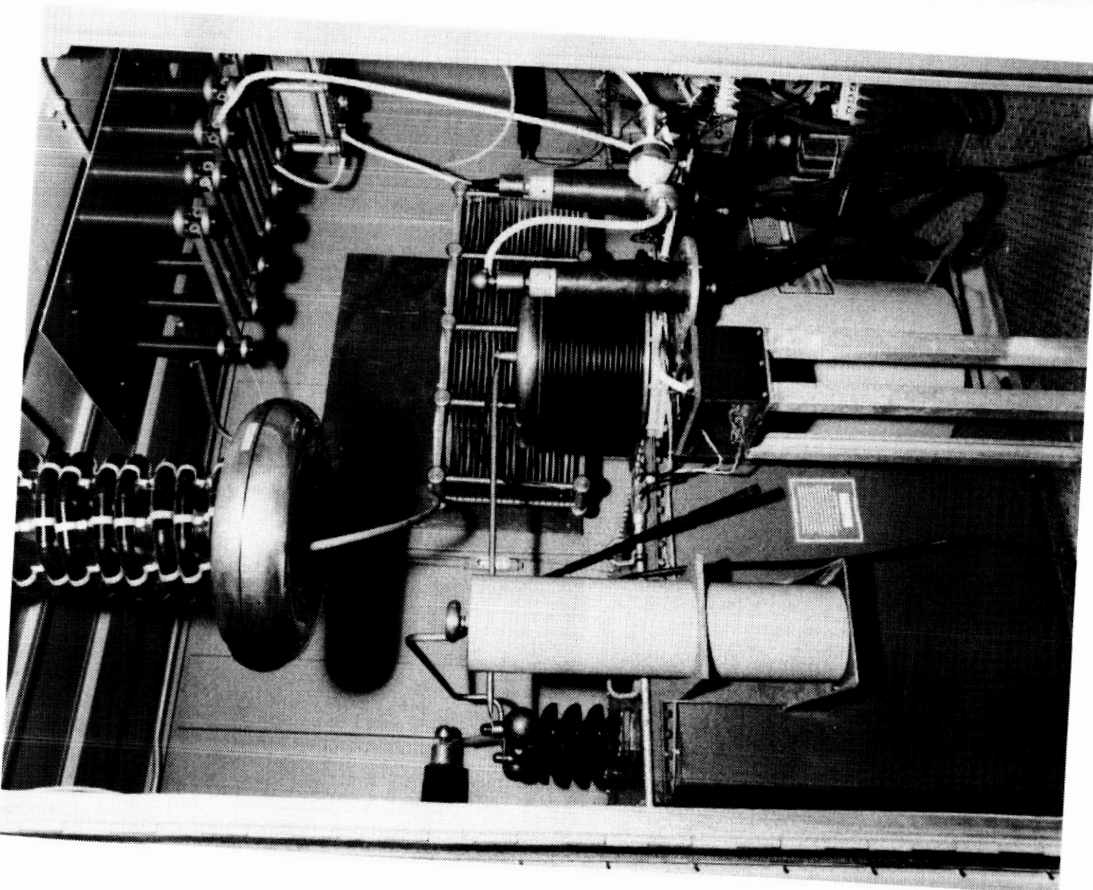


Figure A-19. High-Voltage Capacitor and Choke:  
Venus Station, Transmitter,  
Bldg. G-53A, Room 106

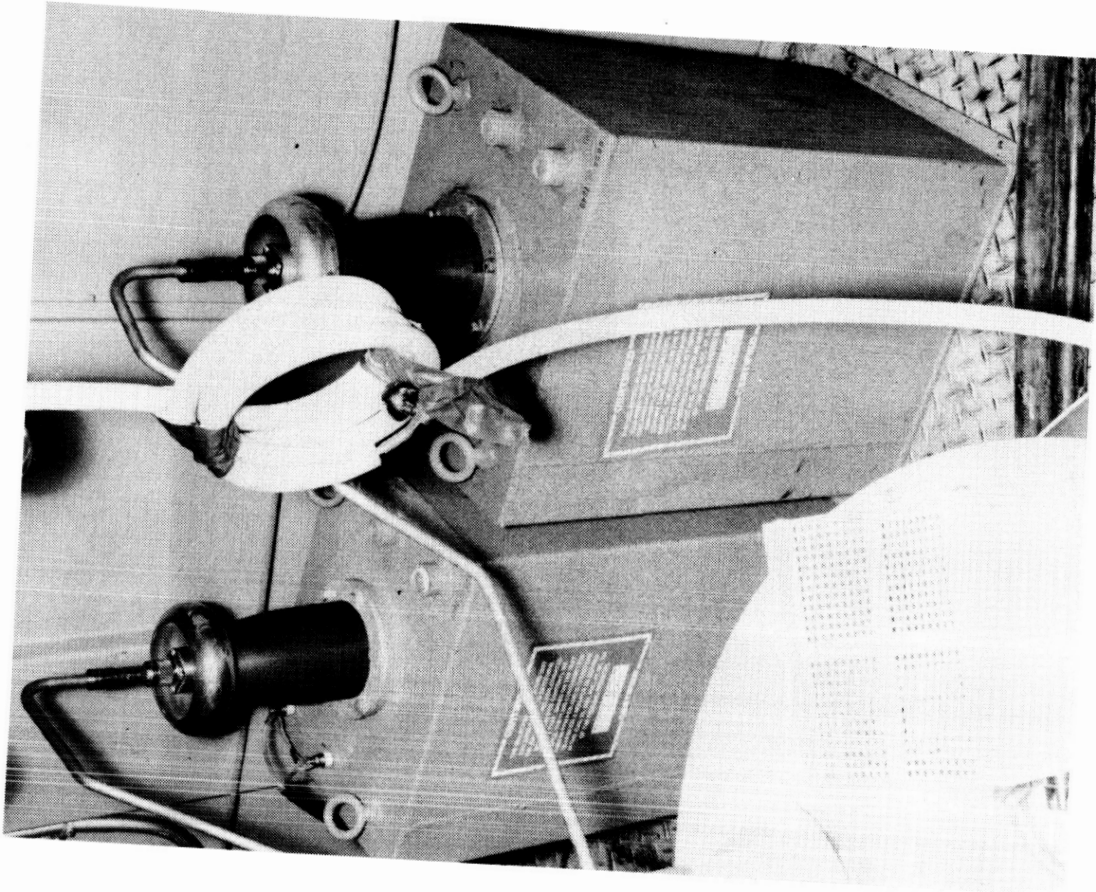


Figure A-20. High-Voltage Capacitors: Venus Station,  
Transmitter, Bldg. G-53A, Room 106



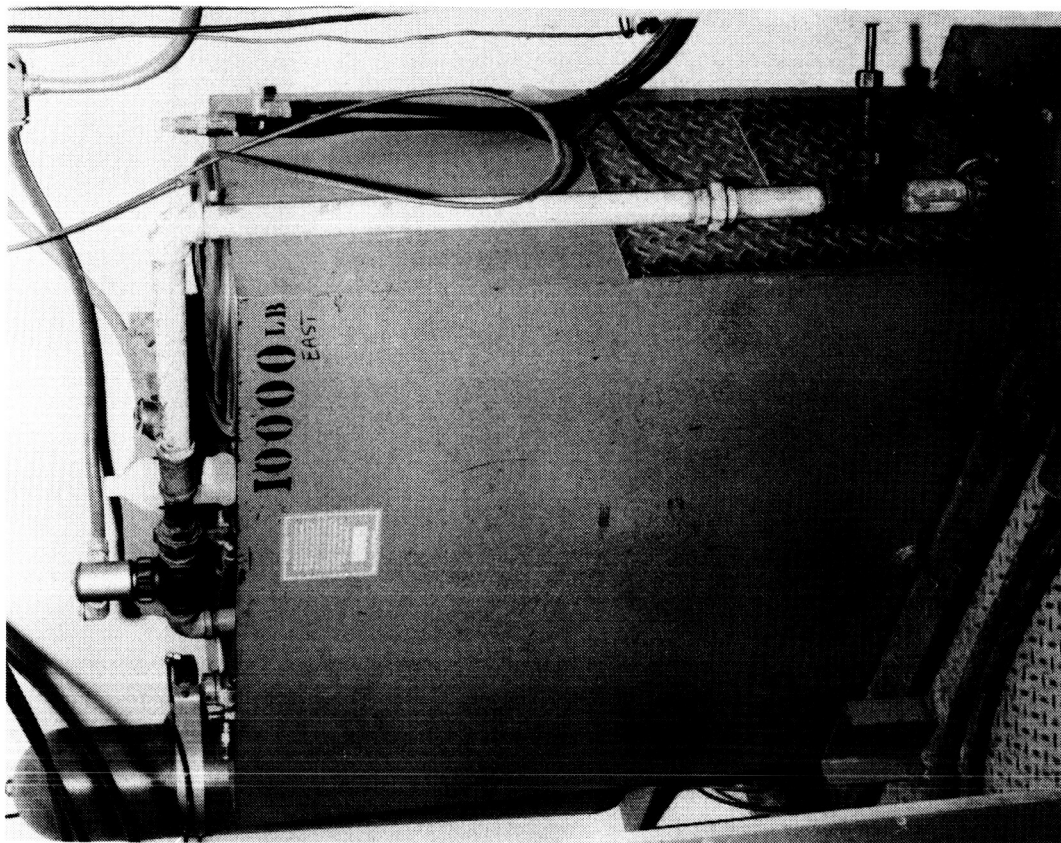


Figure A-22. Hydraulic Hoist Tank: Venus Station,  
Transmitter, Bldg. G-53A, Room 105

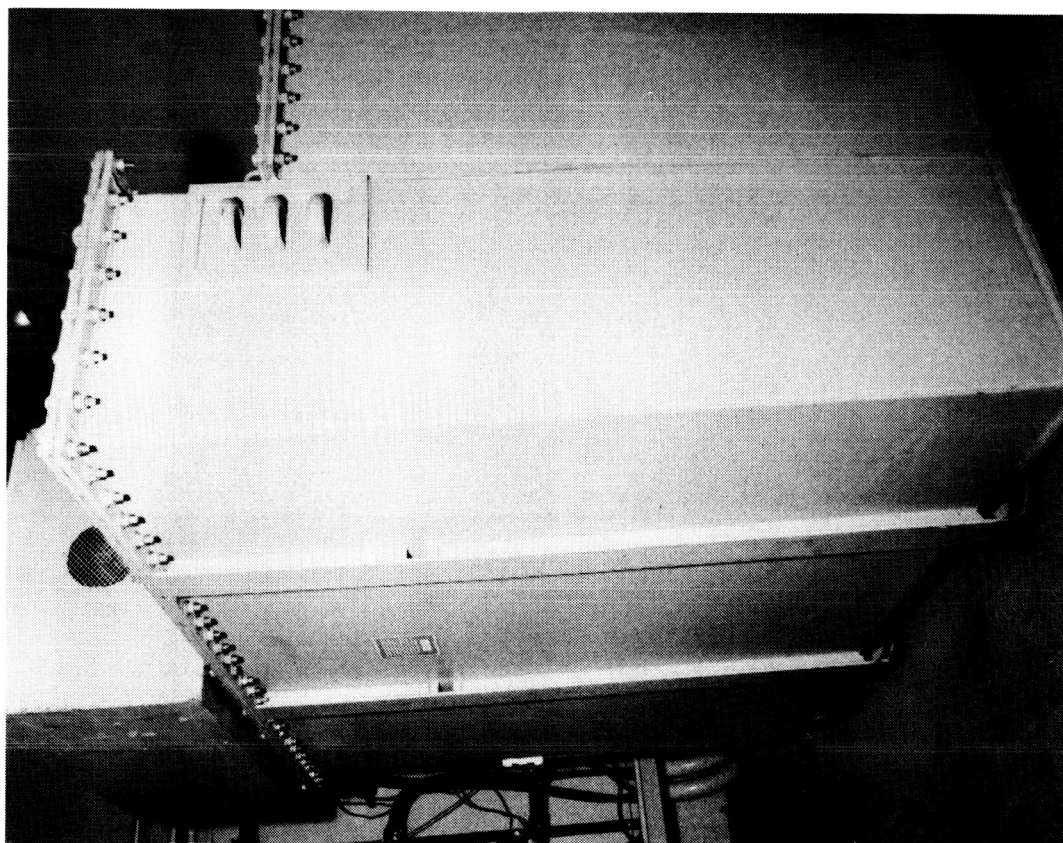


Figure A-21. Transformer-Rectifier: Venus Station,  
Transmitter, Bldg. G-53A, Room 107

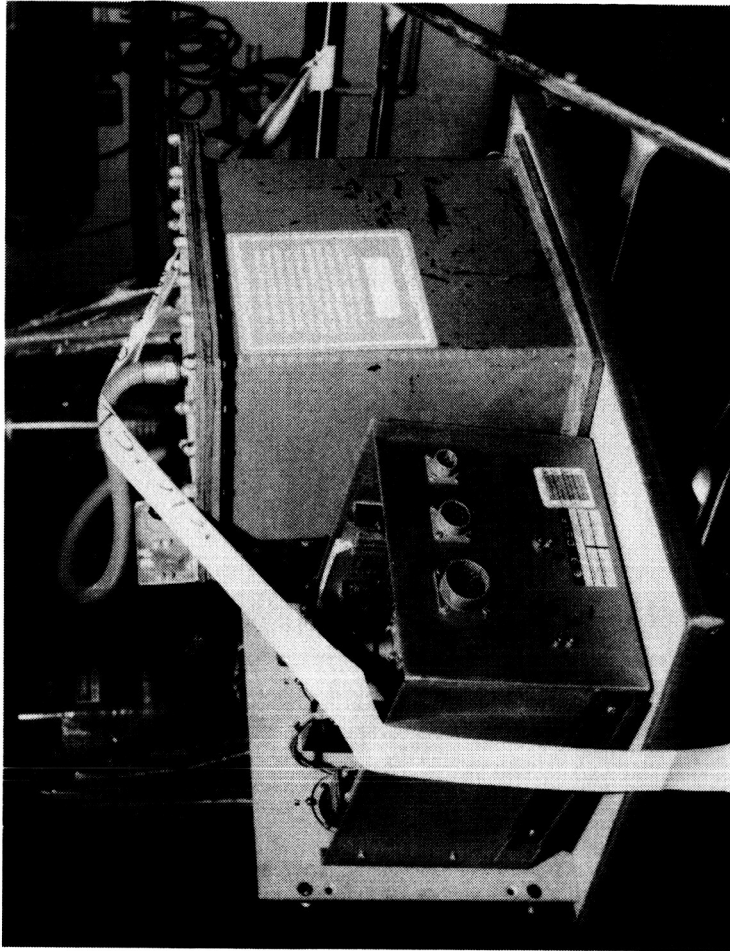


Figure A-24. Filament Transformer: Venus Station,  
Transmitter, Bldg. G-53A, Room 105

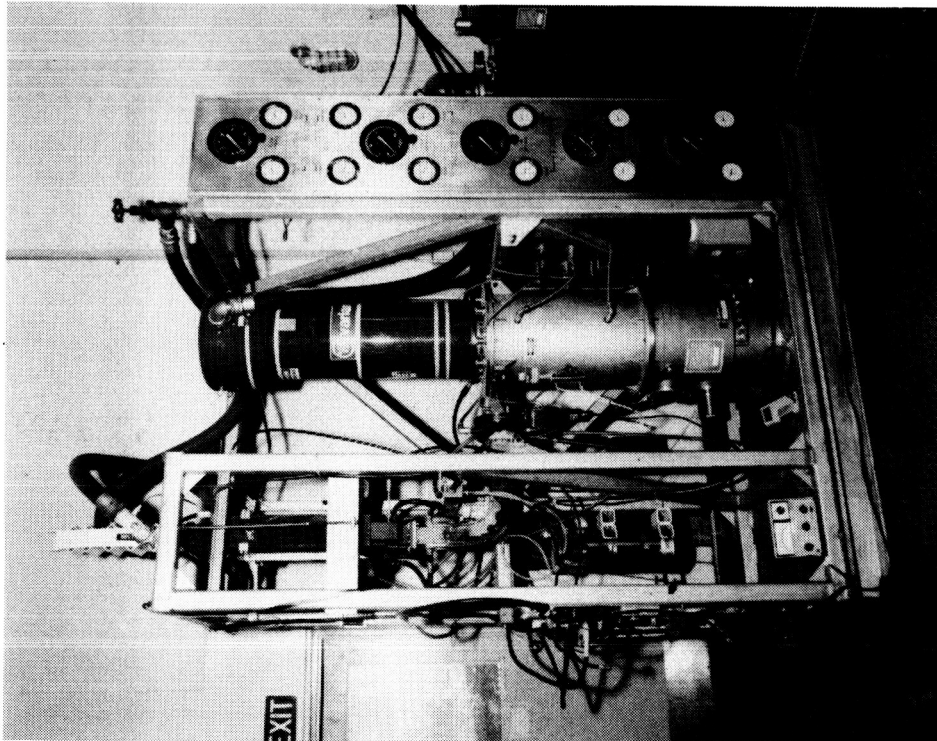


Figure A-23. Transmitter Assembly:  
Venus Station, Transmitter,  
Bldg. G-53A, Room 105

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## MARS STATION DSS 14



Built in 1966, the 64-meter (210 ft) antenna, standing more than 234 ft tall, permitted the DSN's transmitter power and receiver sensitivity to increase 6.5 times compared to that of a 26-meter antenna. It also extended the range of the DSN into deep space by 2.5 times. The 64-meter parabolic dish is to be extended to 70 meters (230 ft) in time to be ready for the Voyager 2 spacecrafts encounter with the planet Neptune in 1989.

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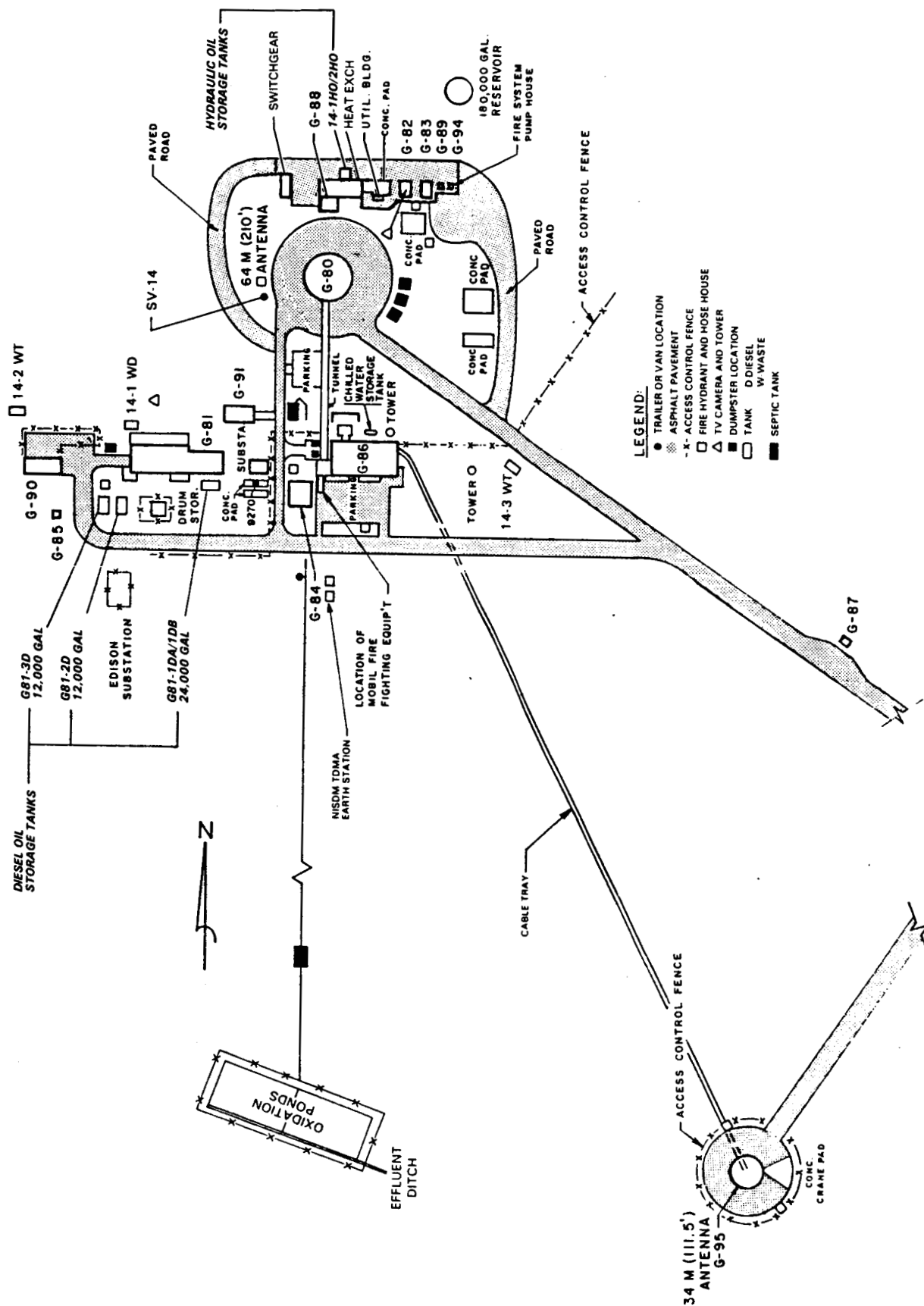


Figure A-25. Mars Site: Plot Plan

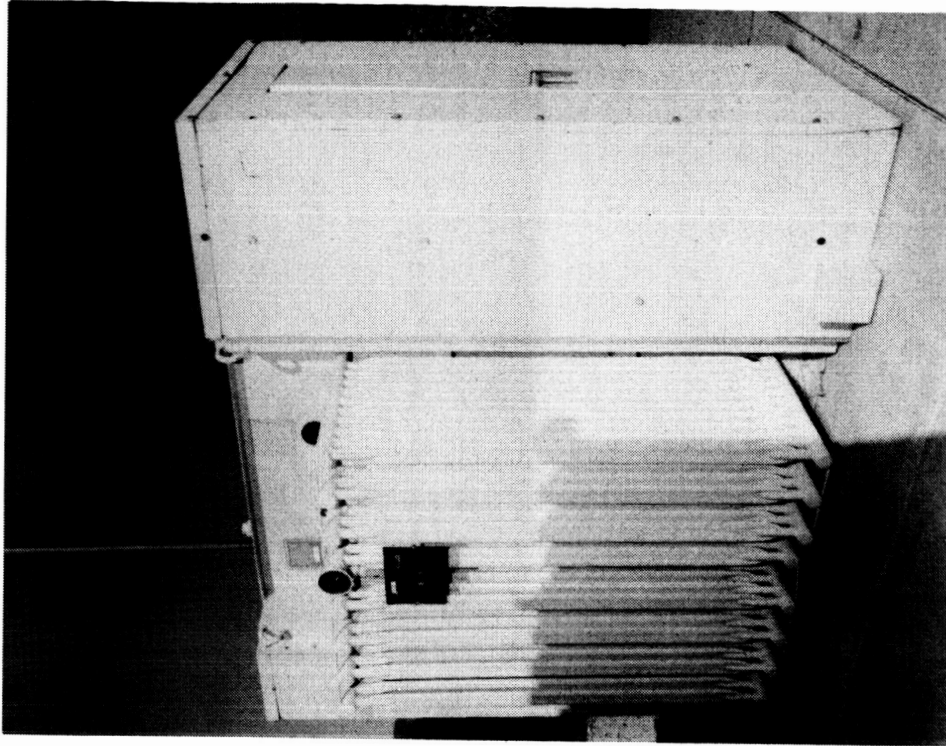


Figure A-27. Switchgear Transformer: Mars  
Station, Outside of Bldg. G-88

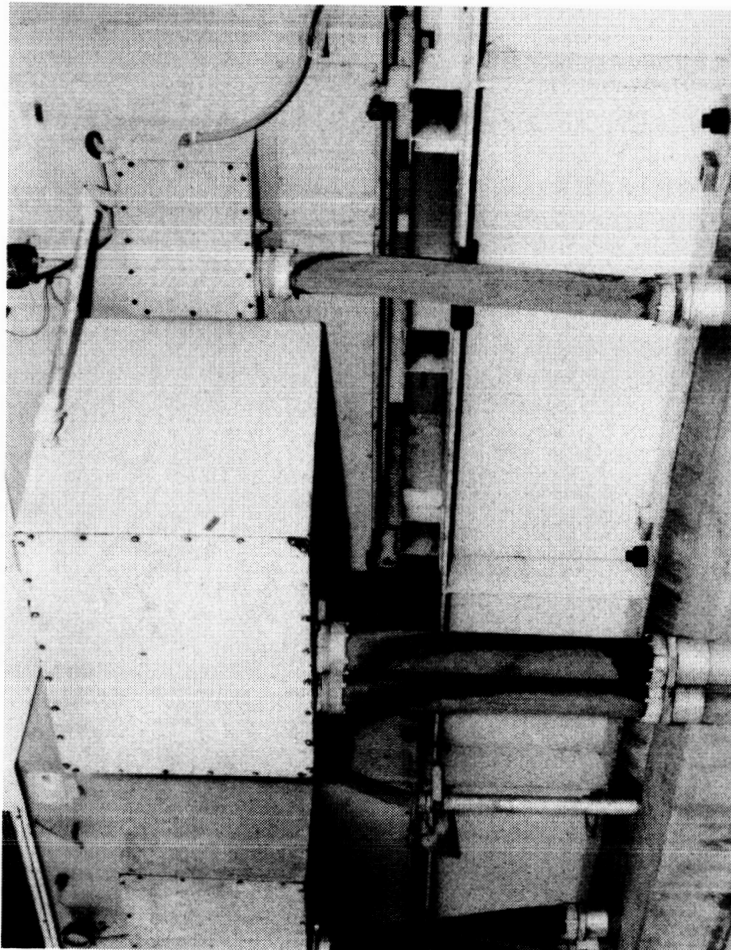


Figure A-26. Heat Exchanger and Motor-Generator Set:  
Mars Station, Outside of Bldg. G-88

ANTENNA DATA:

ANTENNA DIAMETER — 64 METER (210')  
 TYPE MOUNT — AZ/EL  
 TRANSMISSION POWER — 20 & 400 KW  
 PEDESTAL DIAMETER — 82'  
 COORDINATES: N35°25'33"  
 E243°06'41"

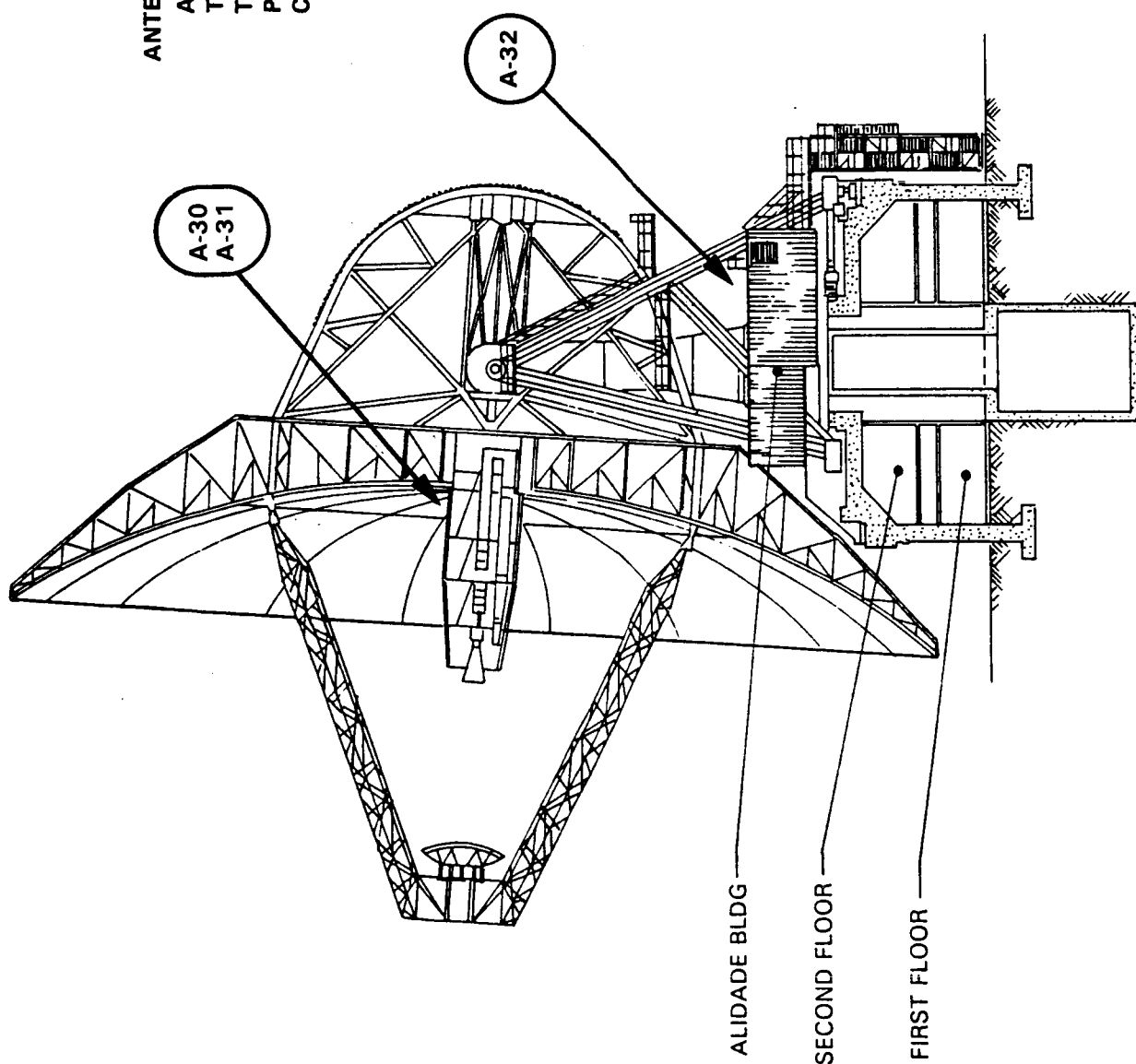
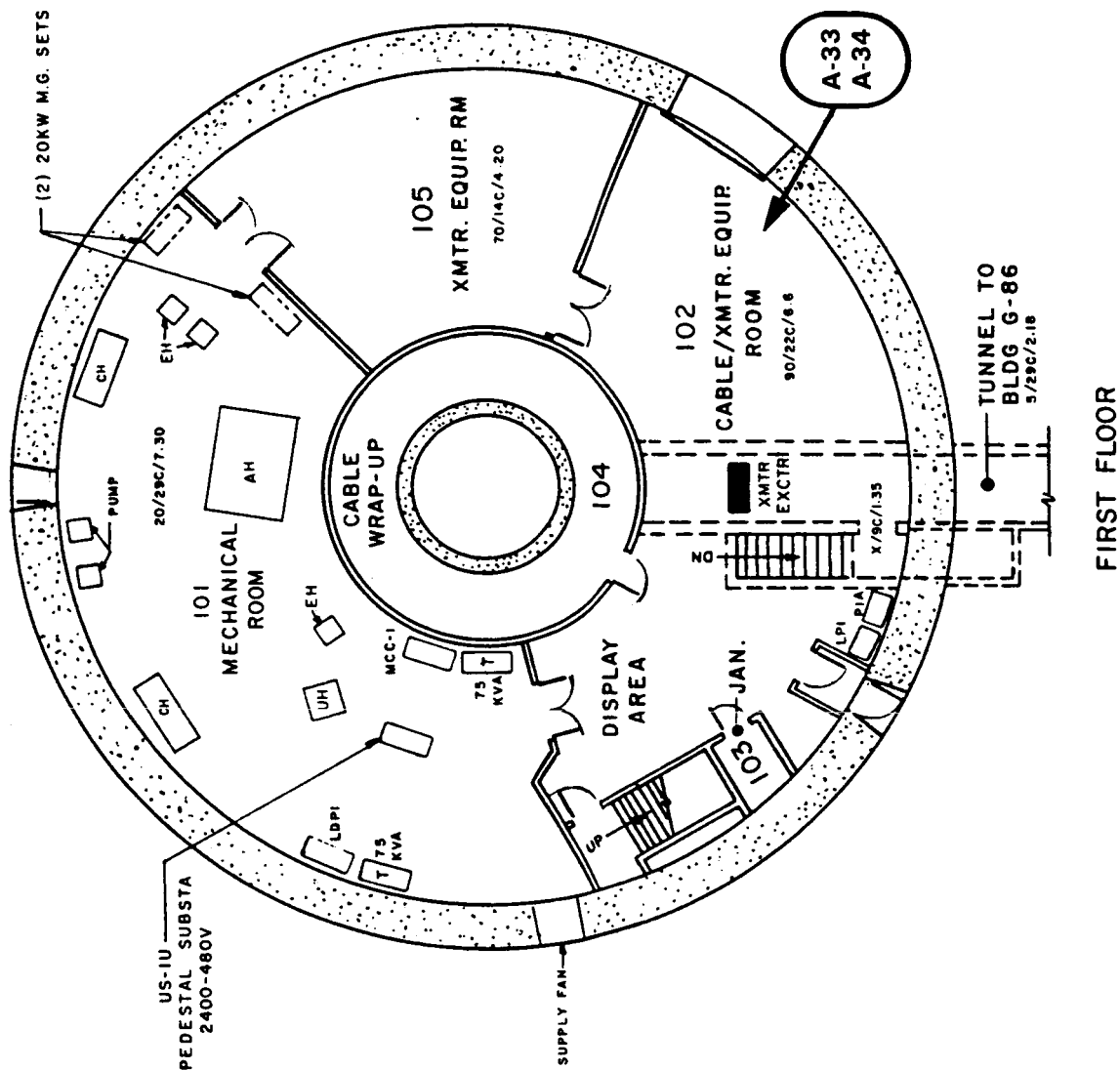


Figure A-28. Mars Site: 210-ft Antenna, Antenna Building (G-80)

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FIRST FLOOR

Figure A-29. Mars Site: 210-ft Antenna, Antenna Building (G-80)

LEGEND:

MOTOR CONTROL PANEL

T TRANSFORMER

ELECTRICAL PANELBOARDS

480V, 3PH, 60HZ

120/208V, 3PH, 60HZ

MECHANICAL EQUIPMENT

AH AIR HANDLER

CH CHILLER

EH ELECTRIC HEATER

UH UNIT HEATER

LIGHTING

PICTURE COUNT (CINCAMB., (P) FLUOR., (E) EXT.

100/12F/1.60

WATTAGE (W)

LIGHT LEVEL (FC)

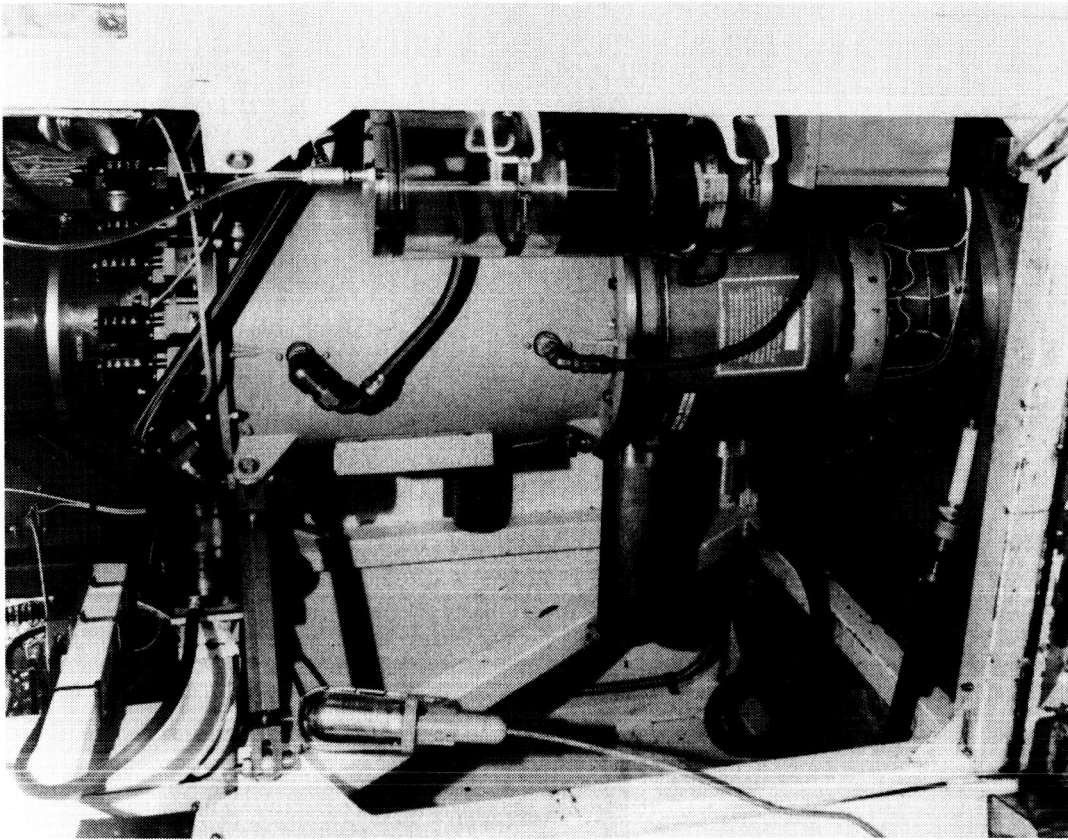


Figure A-31. Klystron Socket Tank in Antenna Cone:  
Mars Station, Bldg. G-80

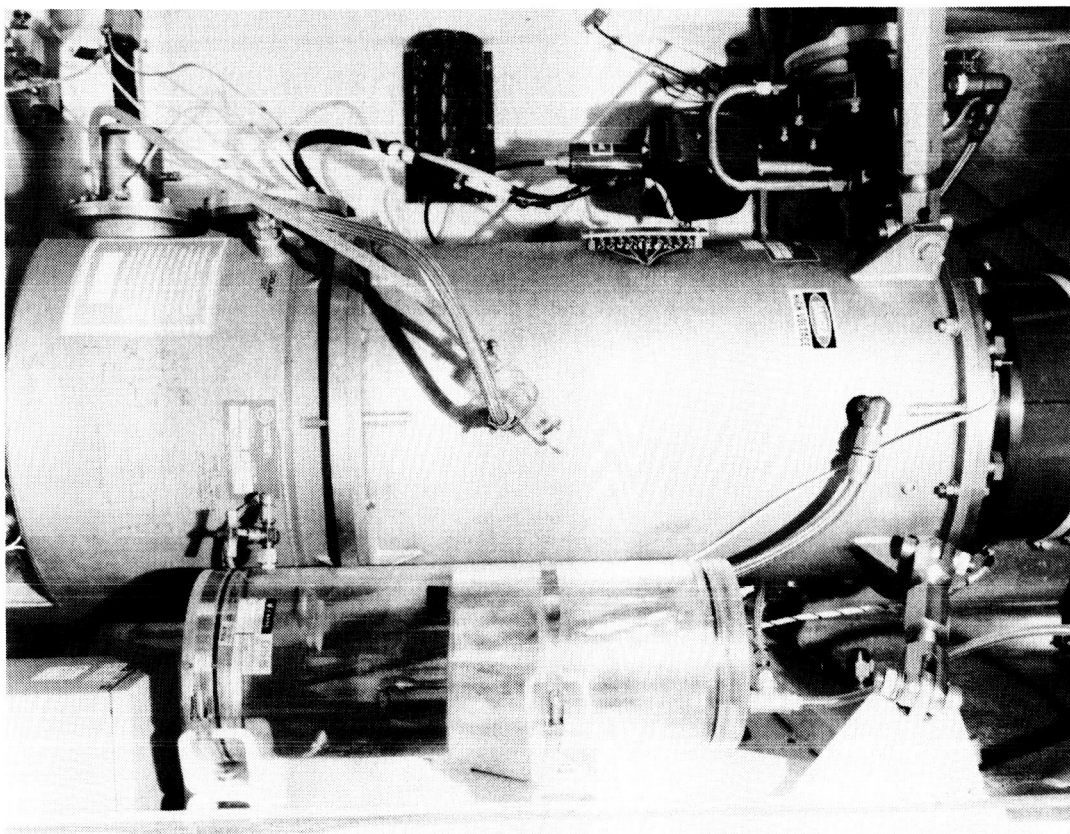


Figure A-30. Klystron Socket Tank in Antenna Cone:  
Mars Station, Bldg. G-80



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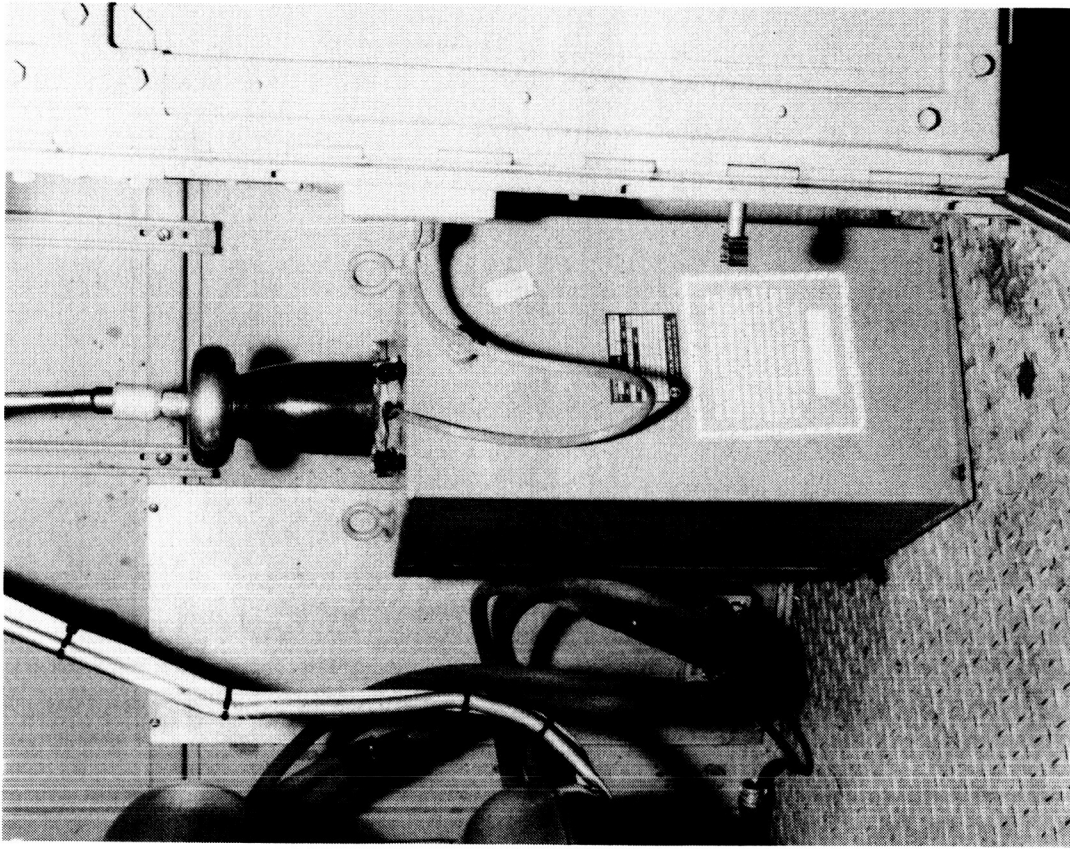


Figure A-33. High-Voltage Crowbar Cabinet: Mars Station, Antenna, Bldg. G-80, Room 102

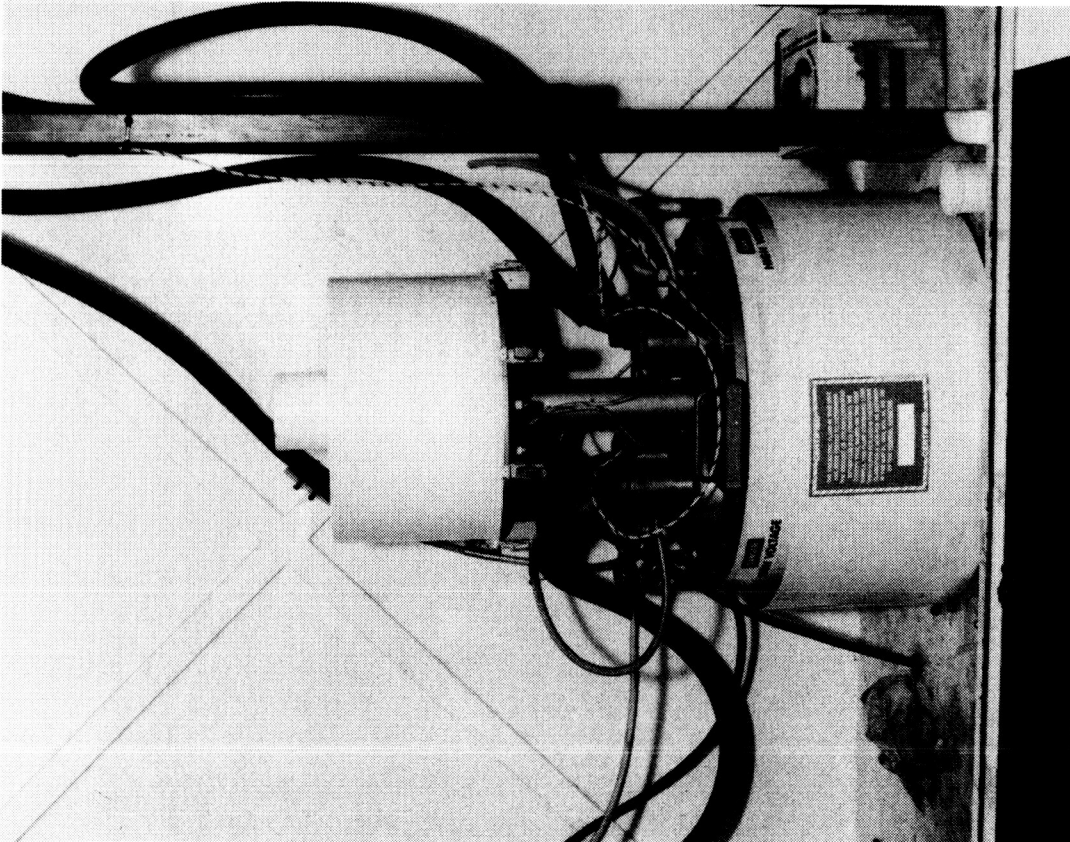


Figure A-32. High-Voltage Equipment: Mars Station, Antenna, Roof of Alidade Bldg., Bldg. G-80

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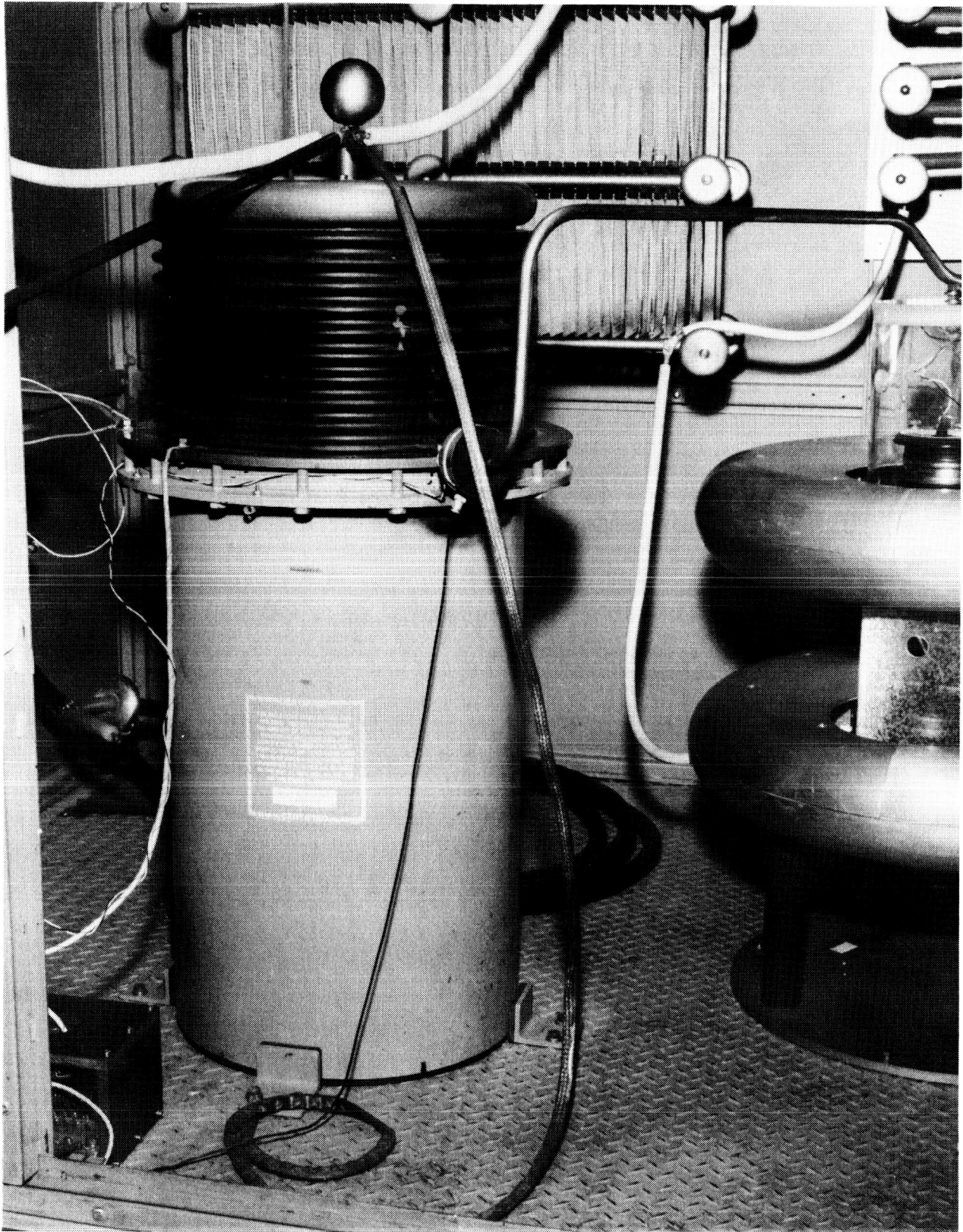


Figure A-34. High-Voltage Crowbar Cabinet: Mars Station,  
Antenna, Bldg. G-80, Room 102

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Figure A-35. Mars Site: Operations Support Building (G-86)



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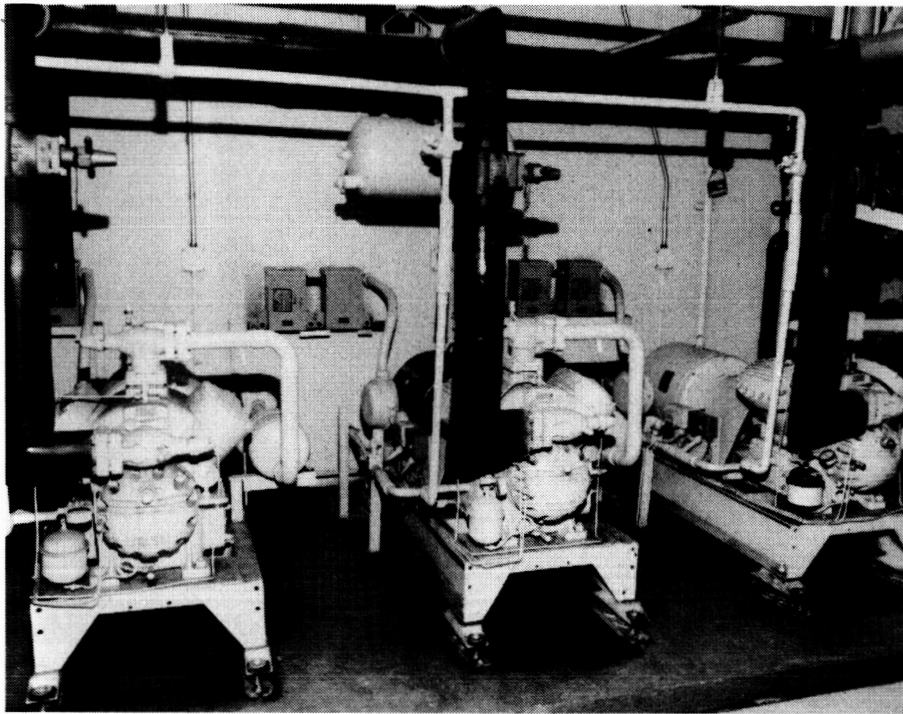


Figure A-36. Power Factor Capacitors: Mars Station,  
Operations Support, Bldg. G-86, Room 104

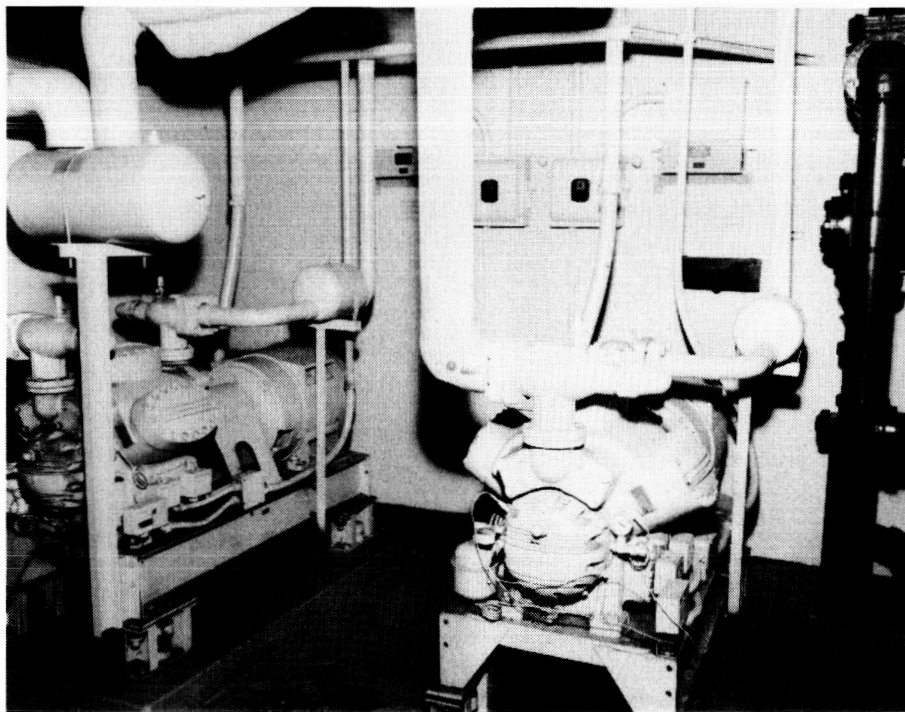


Figure A-37. Power Factor Capacitors: Mars Station,  
Operations Support, Bldg. G-86, Room 107

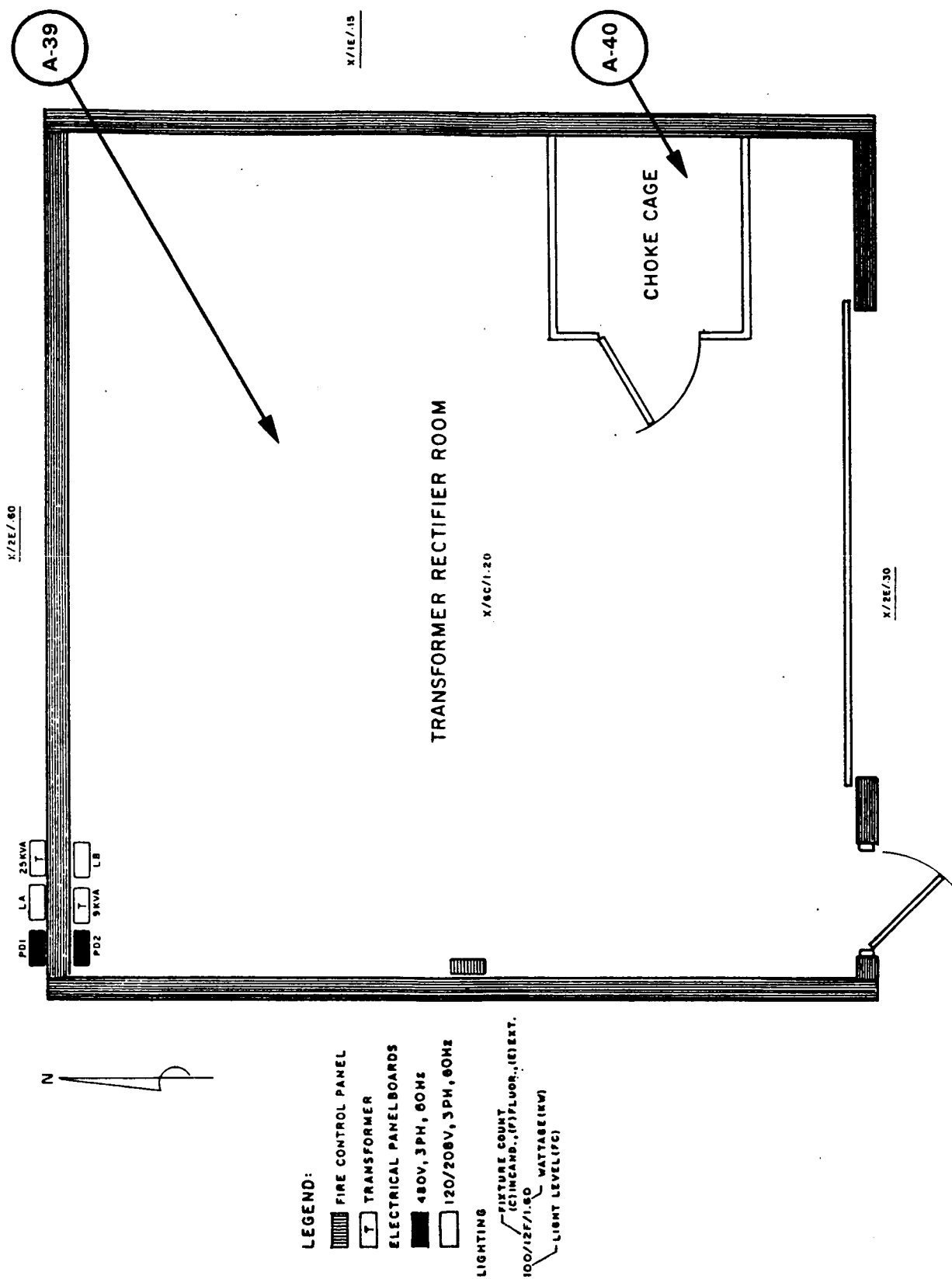


Figure A-38. Mars Site: Transformer Rectifier Building (G-88)

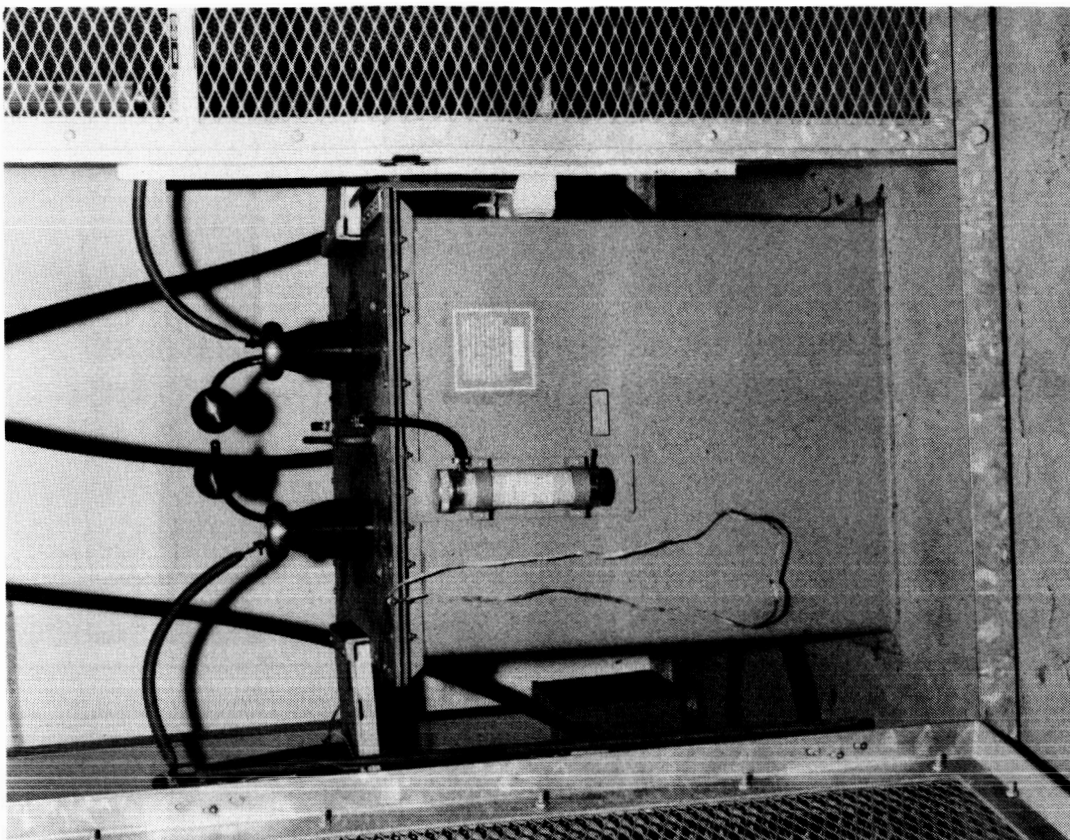


Figure A-40. Choke in Choke Cage: Mars Station,  
Transformer-Rectifier Bldg., G-88

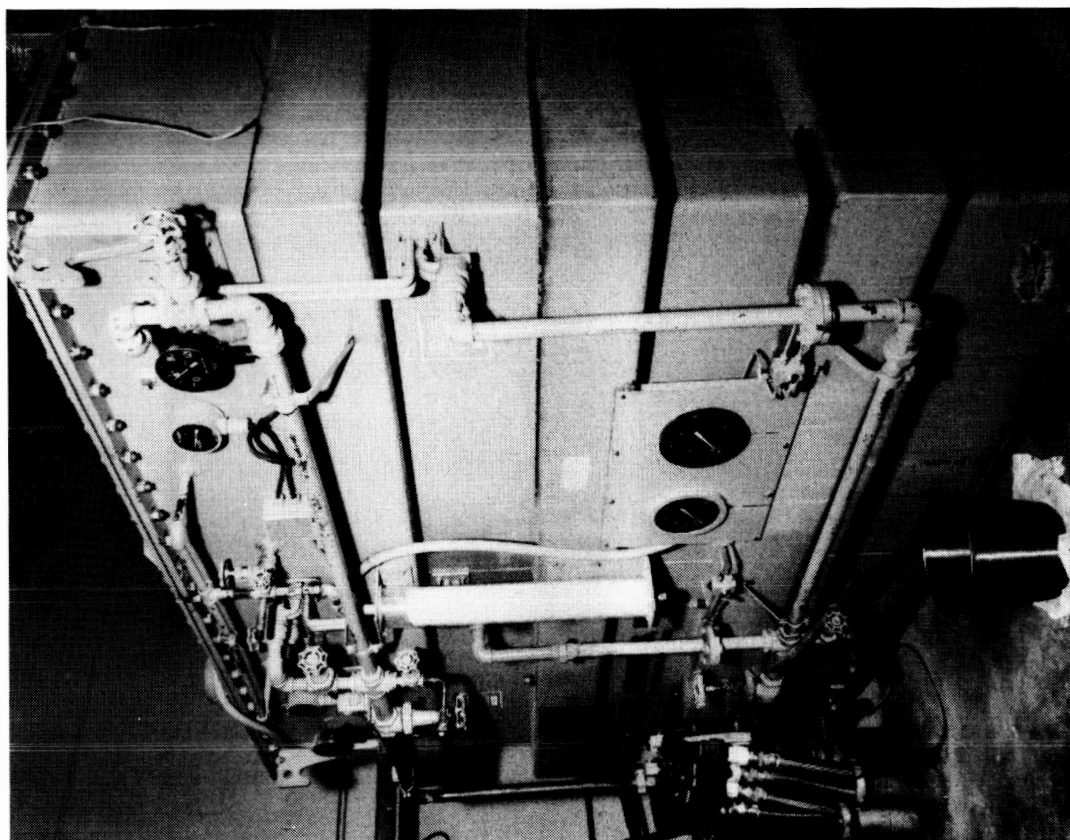
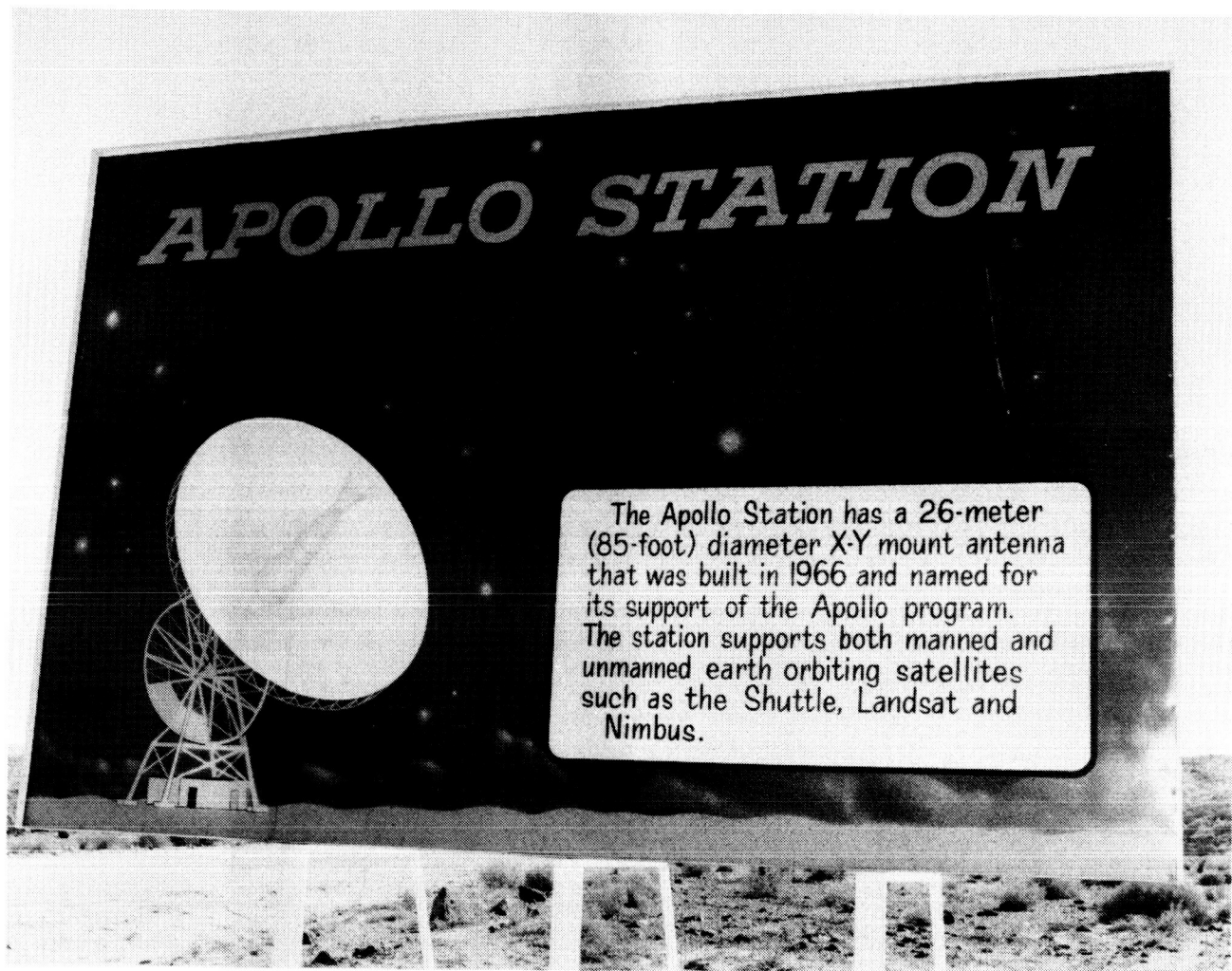


Figure A-39. Transformer-Rectifier: Mars Station,  
Transformer-Rectifier Bldg., G-88

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## APOLLO STATION DSS 16



This 26-meter (85 ft) antenna, built in 1965 by the NASA Goddard Space Tracking and Data Network (STDN) to support the manned Apollo missions to the Moon, was transferred to the DSN in October 1984. The antenna is used to support satellites in both low- and high-Earth orbits as well as STS (Space Shuttle) missions.

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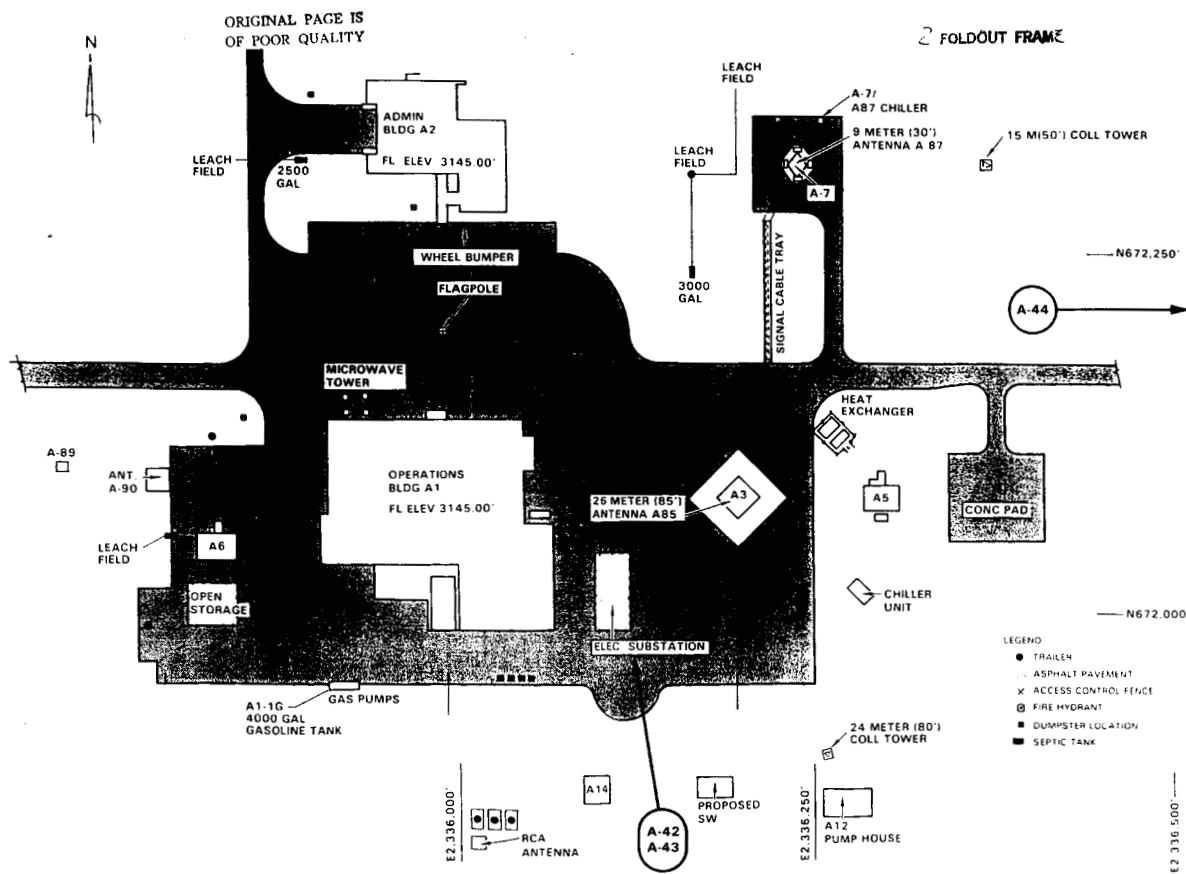


Figure A-41. Apollo Site: Plot Plan

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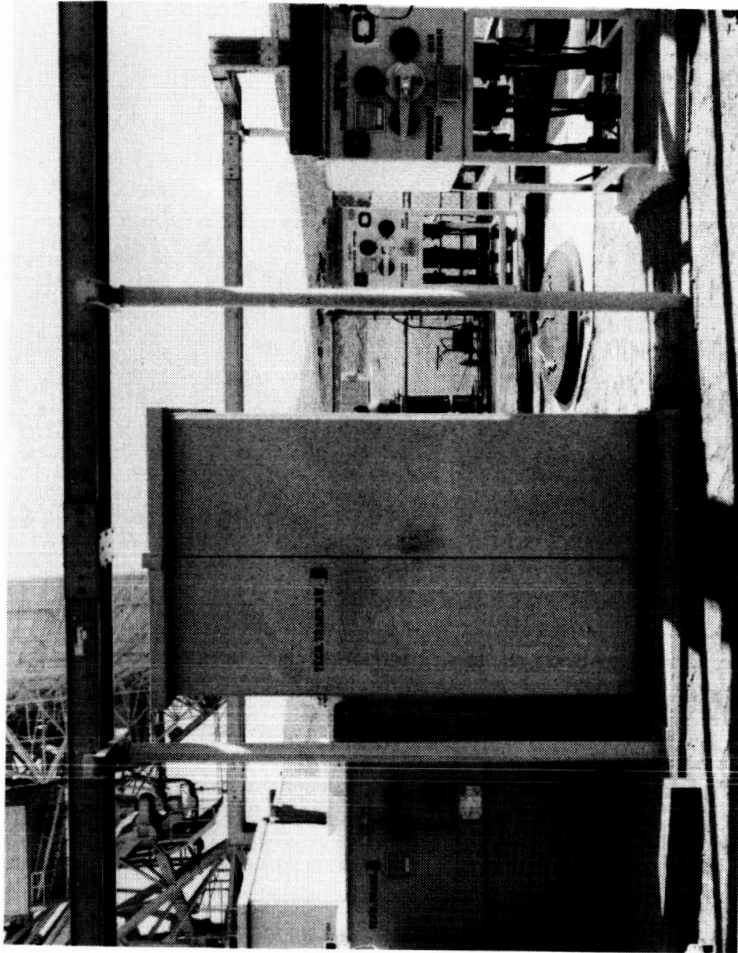


Figure A-43. Electric Substation: Apollo Station,  
Outside of Operations Bldg., A-1

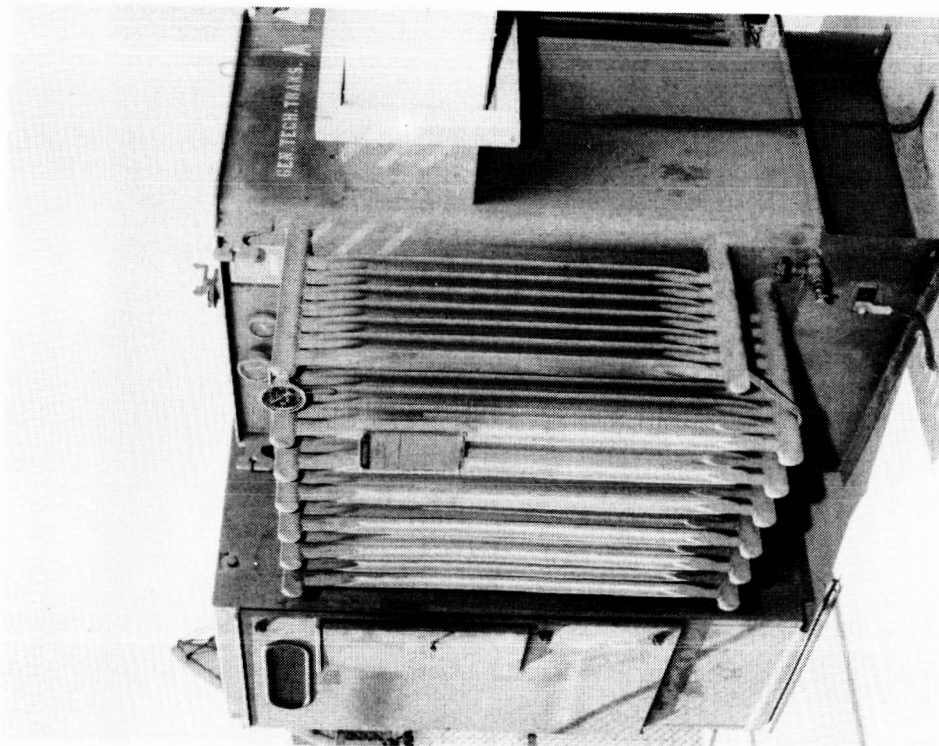


Figure A-42. Retrofilled Transformers: Apollo  
Station, Electric Substation  
Outside of Operations Bldg., A-1

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Figure A-44. New, Replacement Transformer atop Mountain near Apollo Station

## MOJAVE BASE STATION

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In addition to the six NASA/JPL DSSs the Goldstone Complex also has a 12-meter (40 ft) antenna at the Mojave Base Station, located near DSS 16, the Apollo Station. This antenna now is operated by NOAA.

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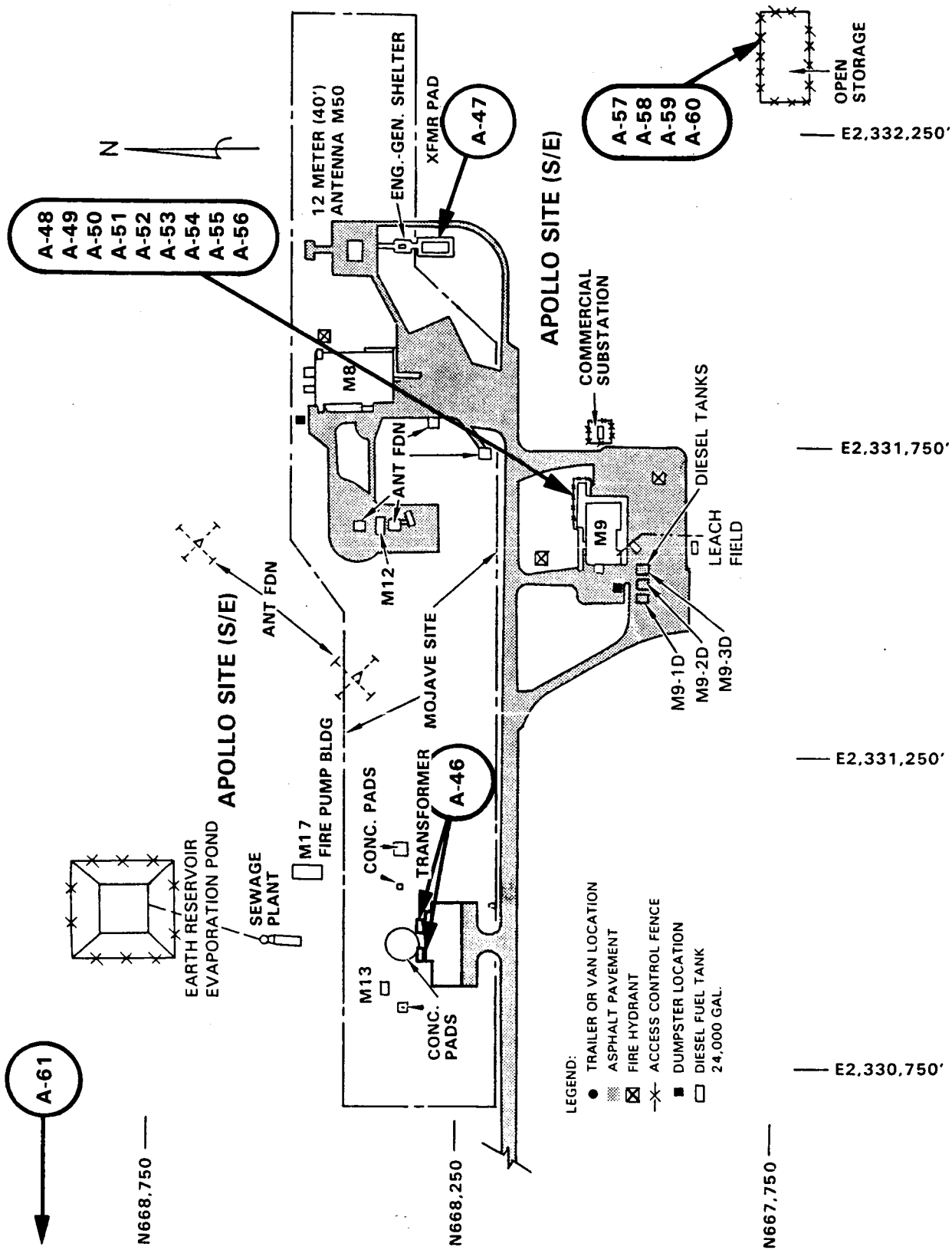


Figure A-45. Mojave Site: Plot Plan

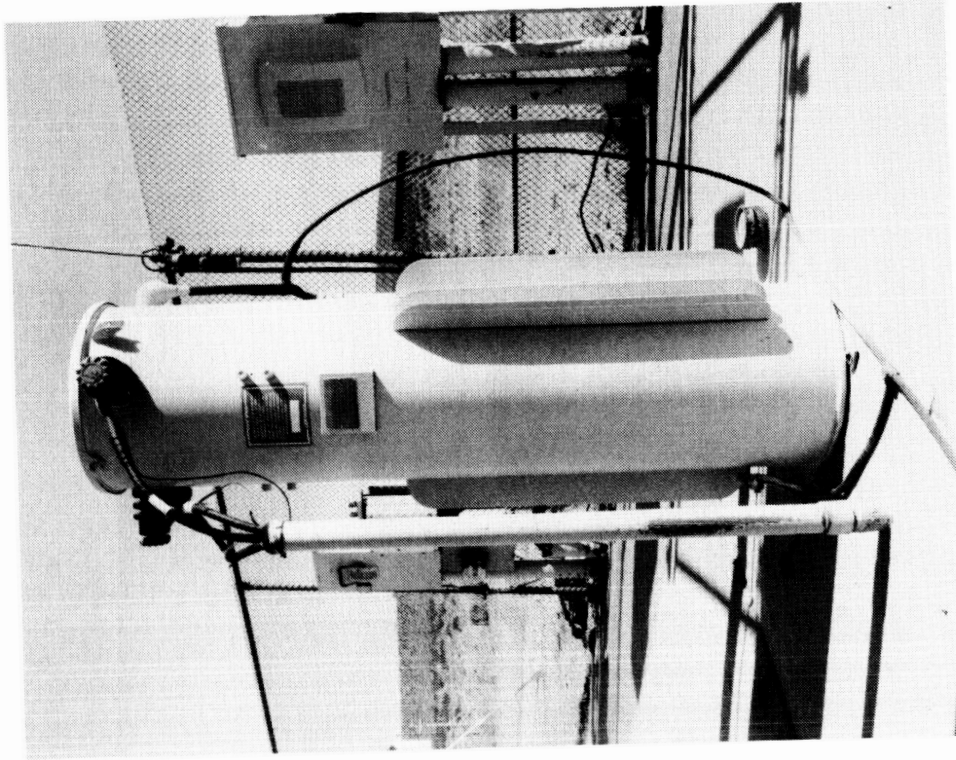


Figure A-47. Transformer and Pad: Mojave  
Base Station, near M8

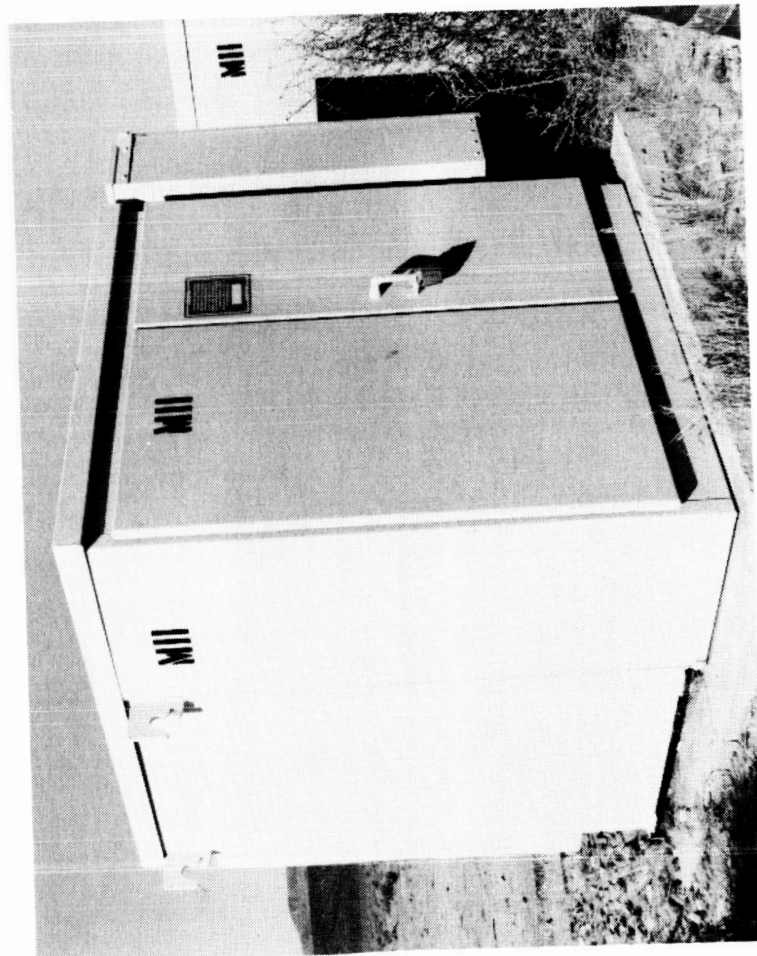


Figure A-46. Transformer: Mojave Base Station, near M13

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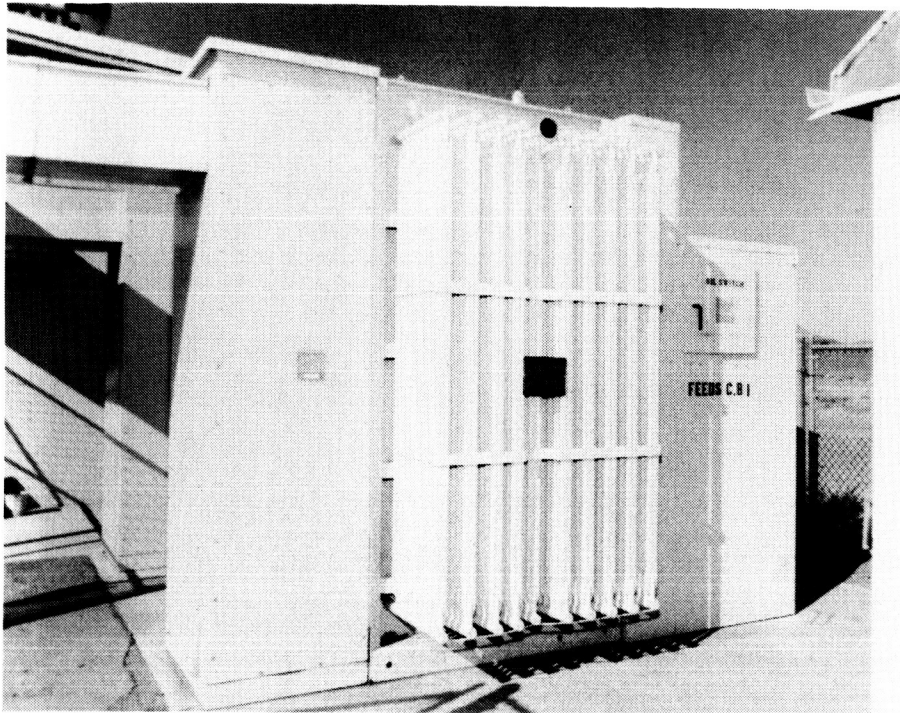


Figure A-48. Electrical Equipment: Mojave Base Station,  
Outside of M9

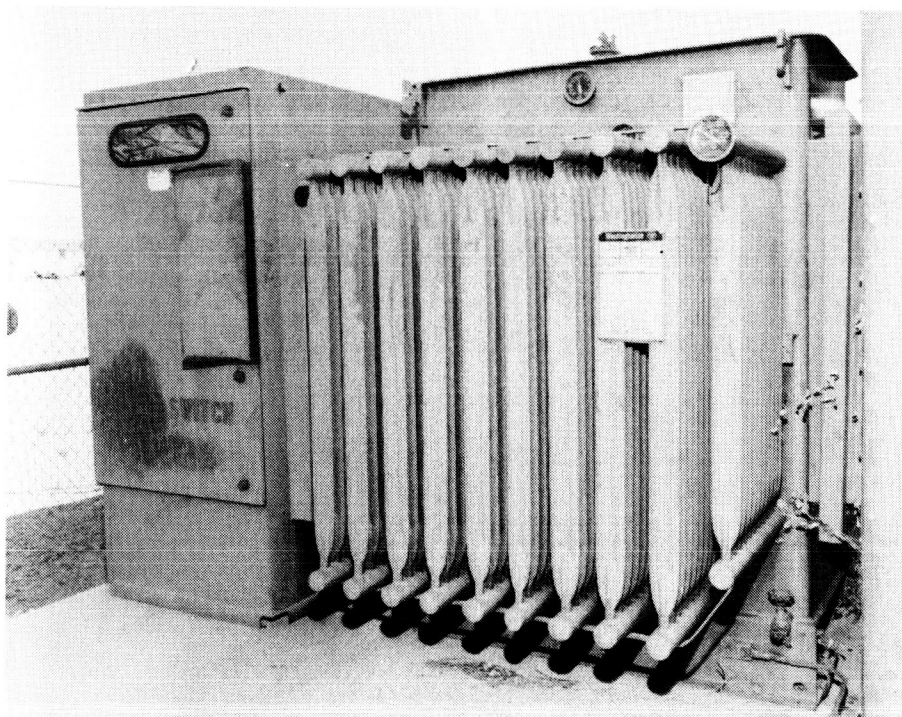


Figure A-49. Electrical Equipment: Mojave Base Station,  
Outside of M9

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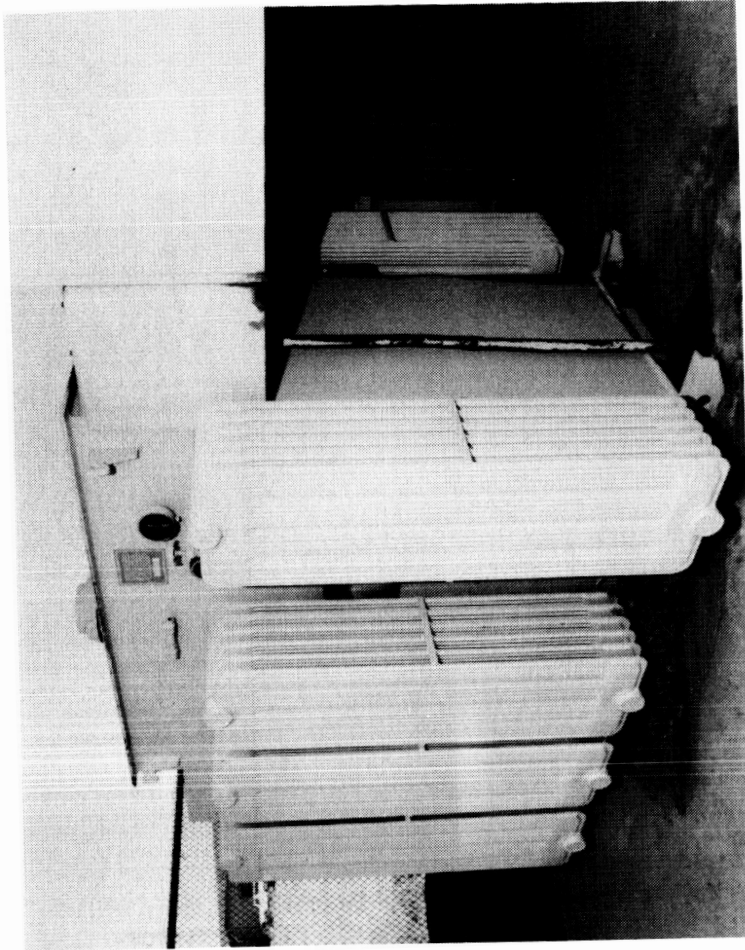


Figure A-51. Electrical Equipment: Mojave Base Station,  
Outside of M9

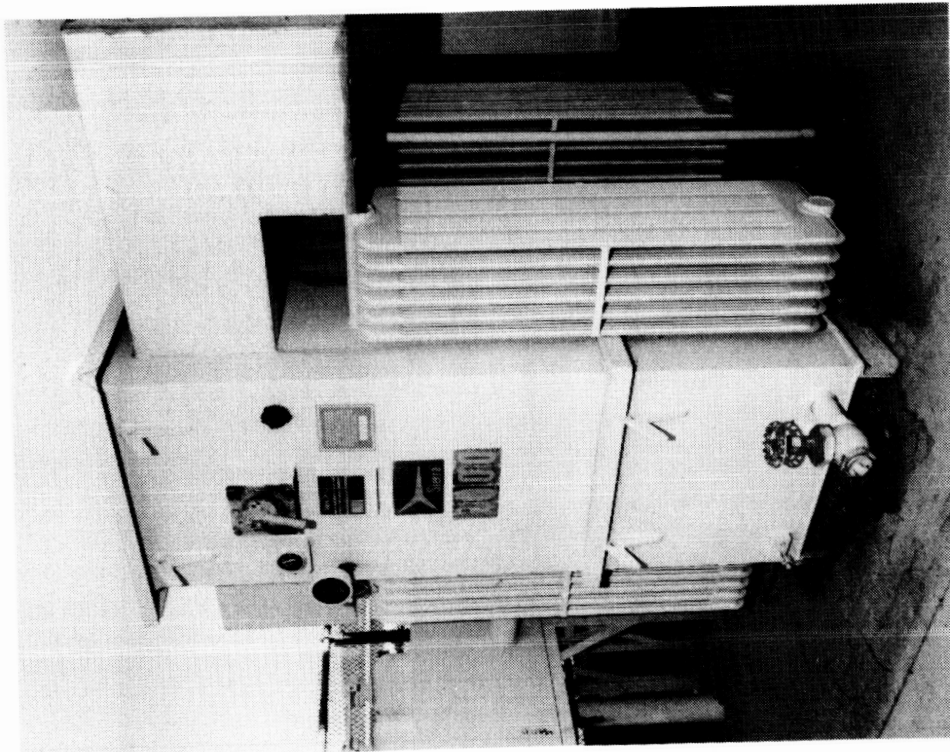


Figure A-50. Electrical Equipment: Mojave  
Base Station, Outside of M9



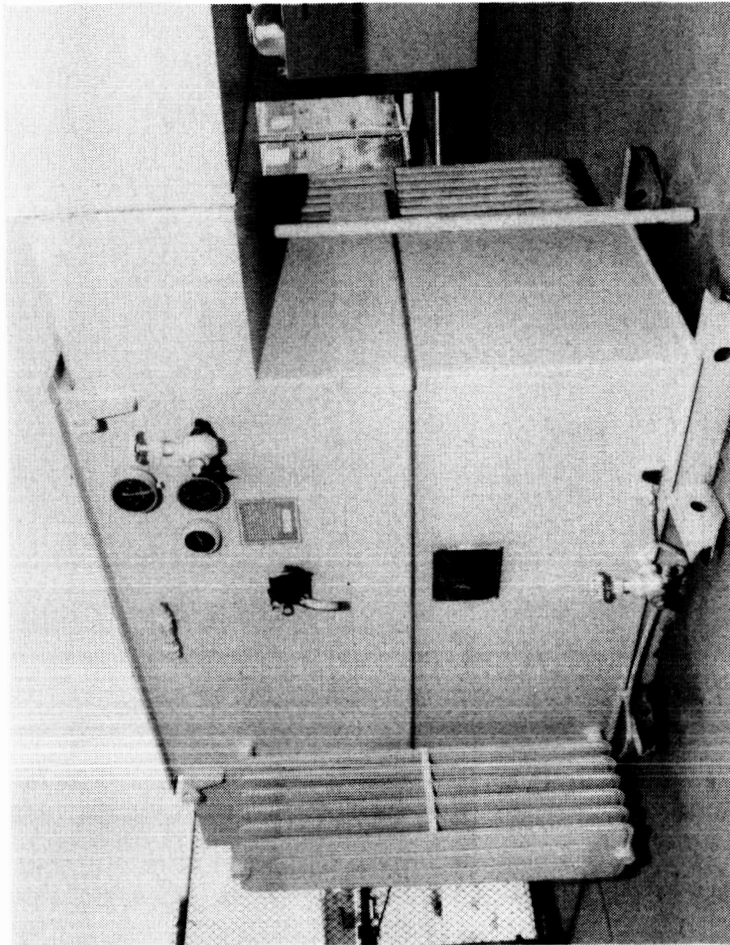


Figure A-53. Electrical Equipment: Mojave Base Station,  
Outside of M9

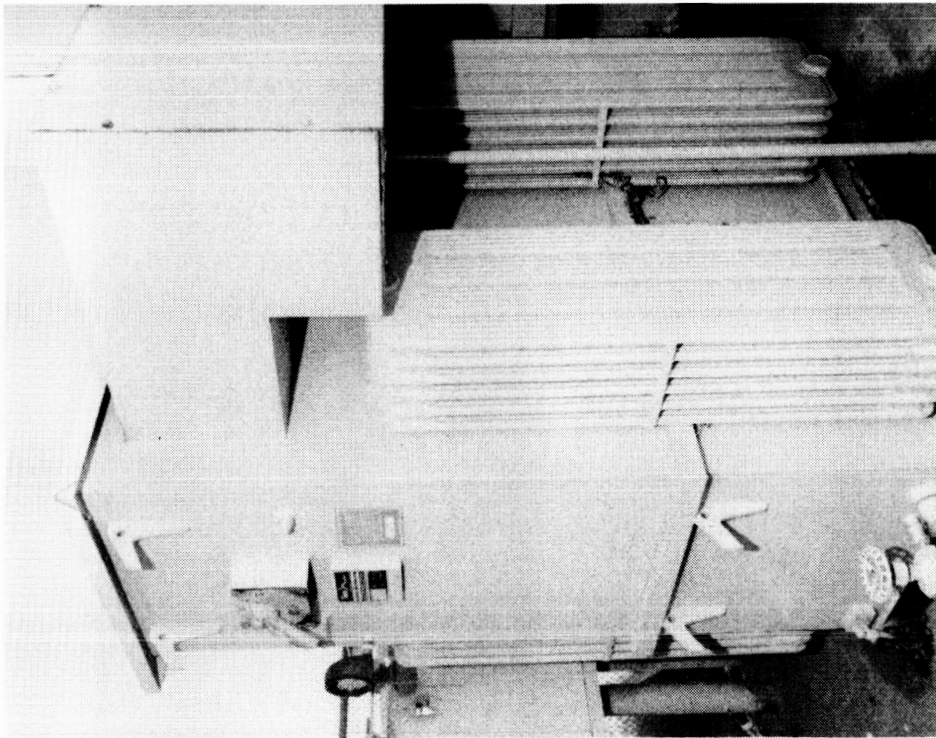


Figure A-52. Electrical Equipment: Mojave  
Base Station, Outside of M9

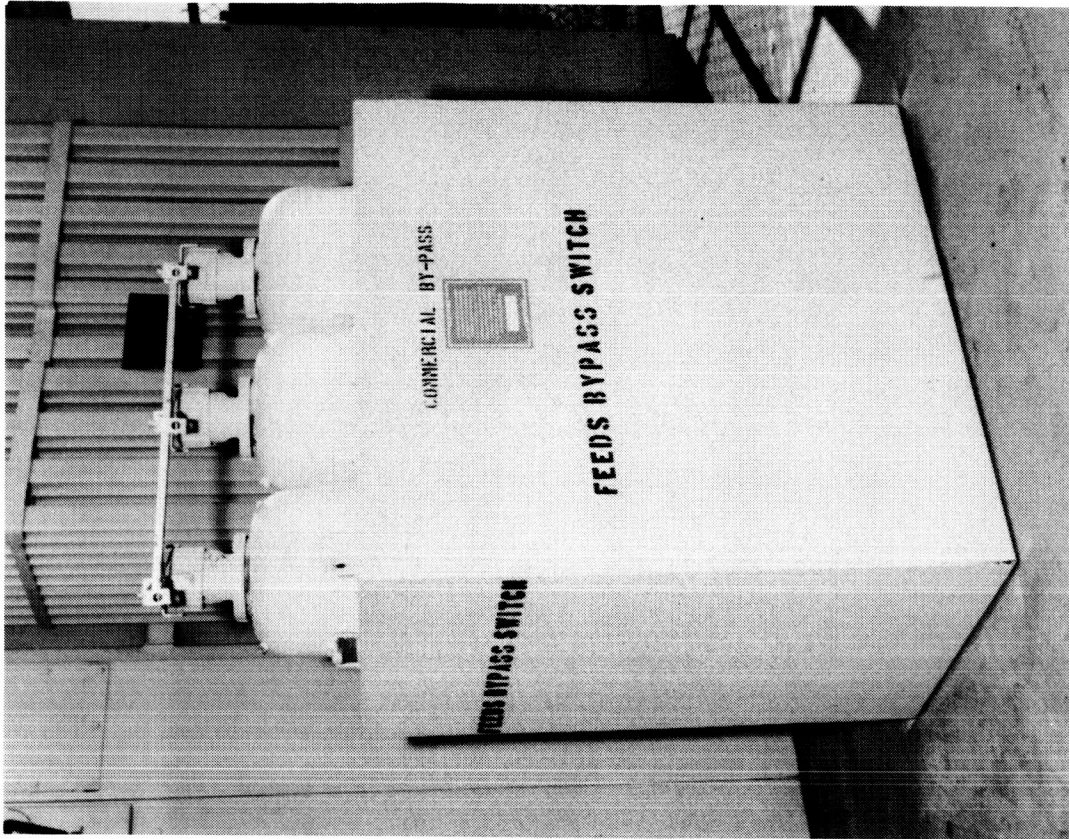


Figure A-55. Electrical Equipment: Mojave Base Station, Outside of M9

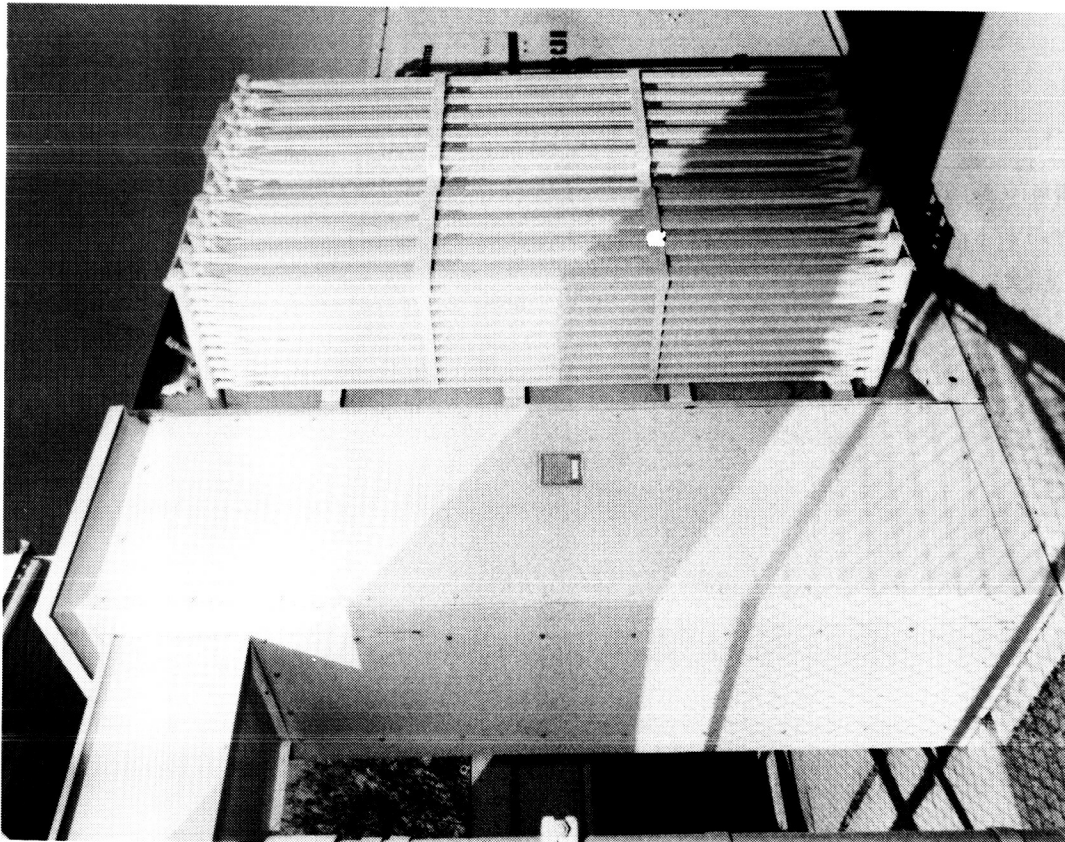


Figure A-54. Electrical Equipment: Mojave Base Station, Outside of M9

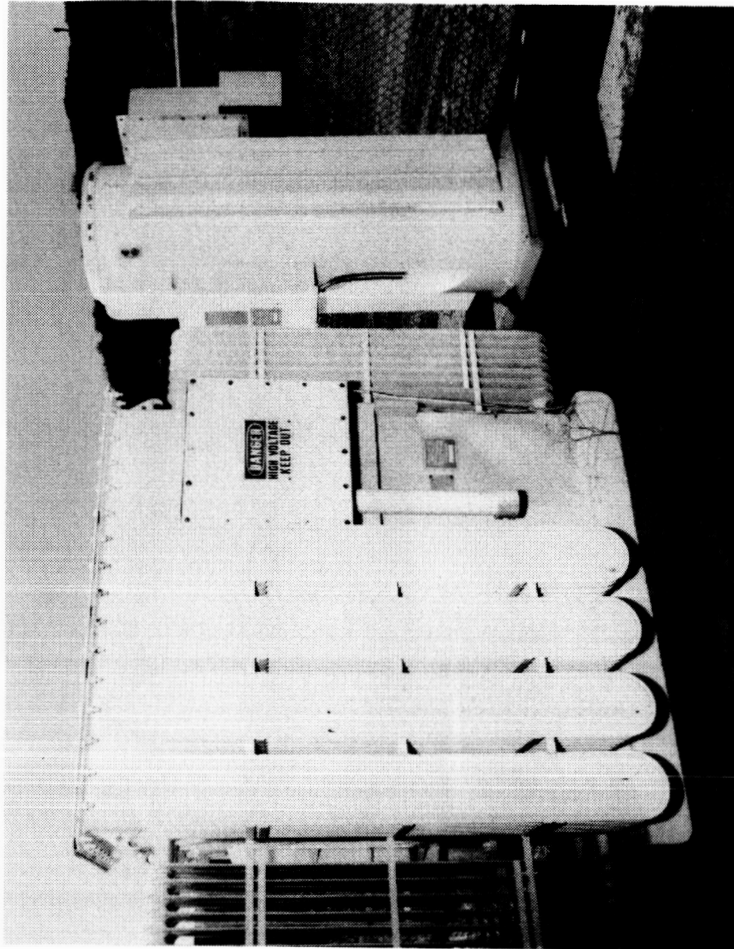


Figure A-57. Stored Equipment: Mojave Base Station,  
Open Storage Area

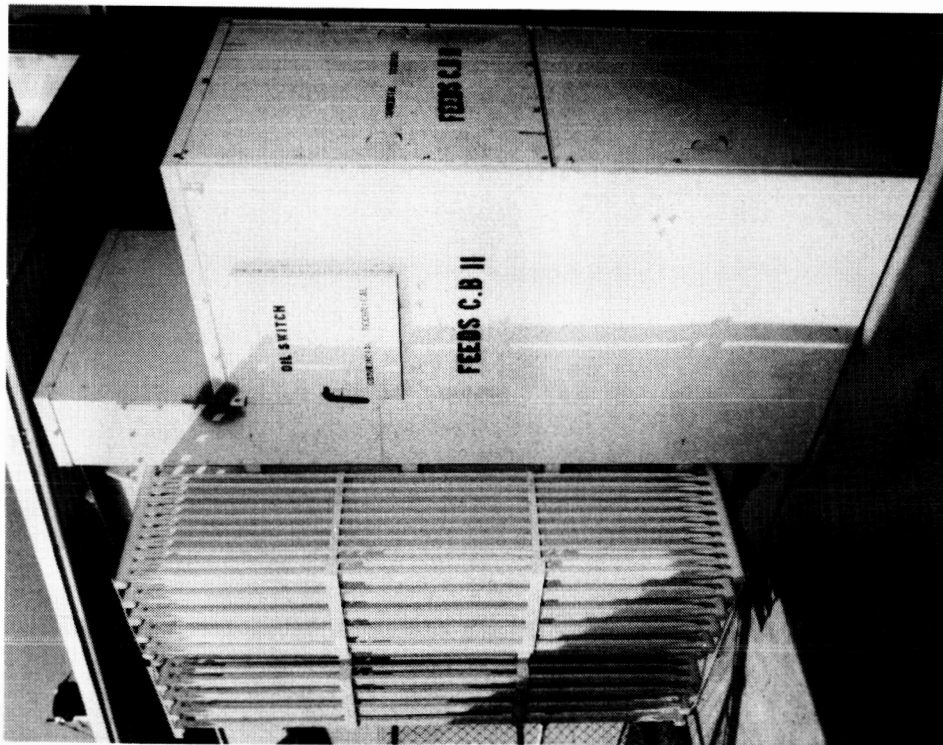


Figure A-56. Electrical Equipment: Mojave  
Base Station, Outside of M9



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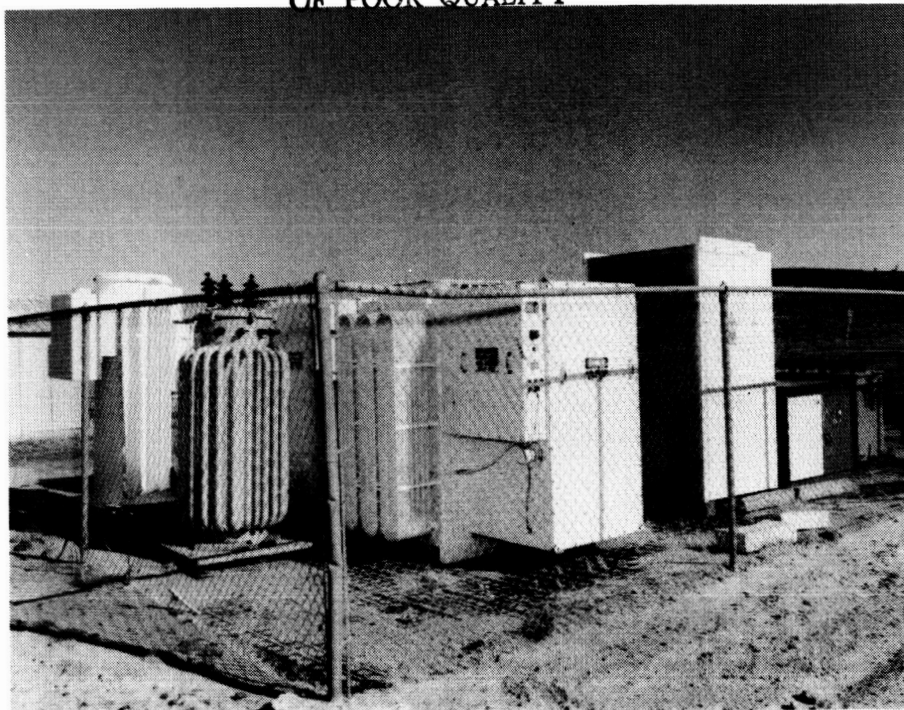


Figure A-58. Stored Equipment: Mojave Base Station, Open Storage Area

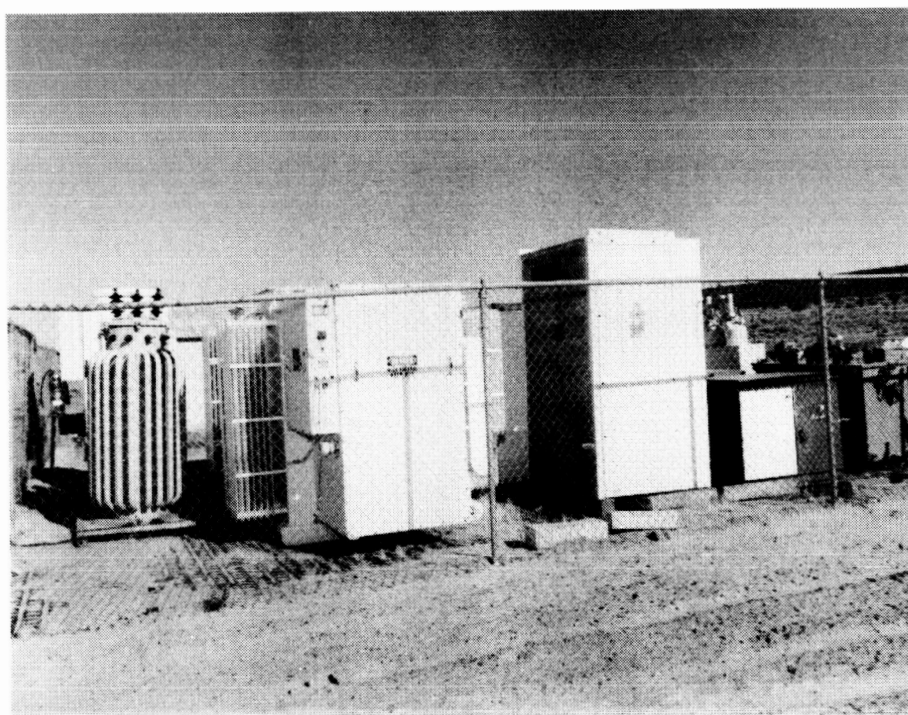


Figure A-59. Stored Equipment: Mojave Base Station, Open Storage Area



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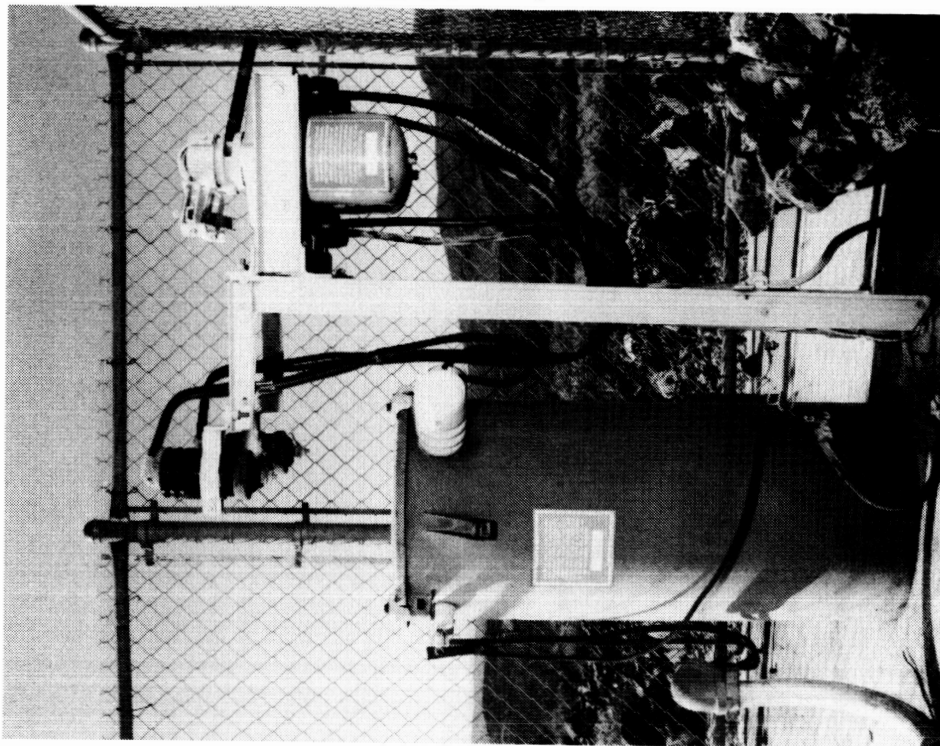


Figure A-61. Substation M-20 for Collimation  
Tower: On Mountain near Mojave  
Base Station

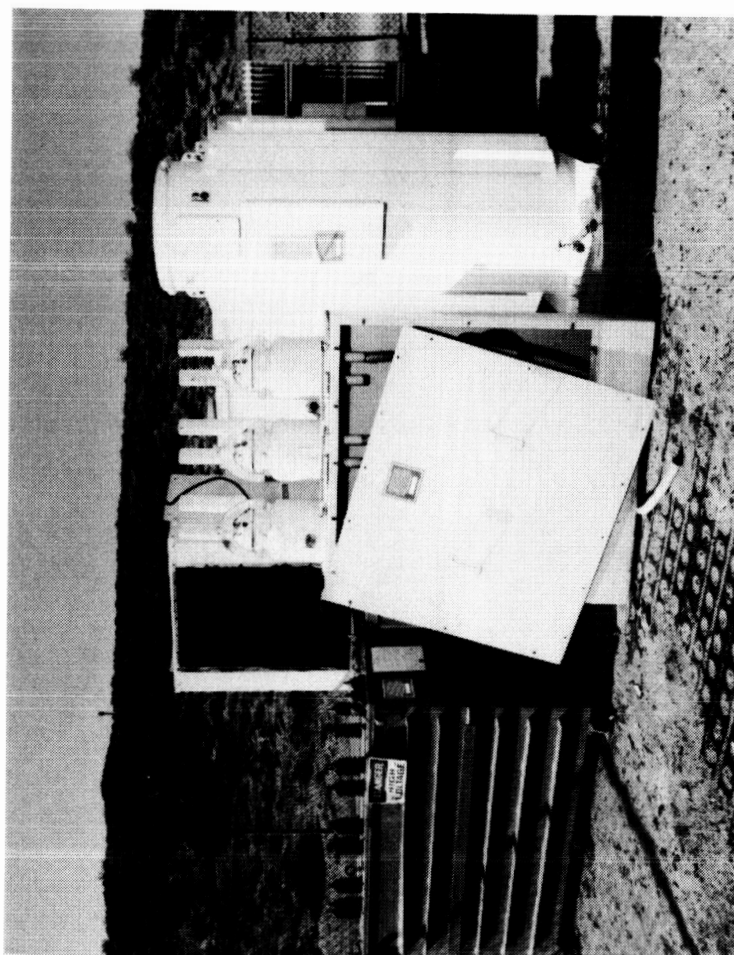


Figure A-60. Stored Equipment: Mojave Base Station,  
Open Storage Area

## PCB ABATEMENT WORK AT THREE MISCELLANEOUS SITES AT THE GOLDSTONE COMPLEX

In addition to the PCB-abatement work carried out at the five operational antenna sites, the PCB-abatement program also included work conducted at the following three miscellaneous sites at the Goldstone Deep Space Communications Complex:

- 1) Pump House (located at Ft. Irwin NTC).
- 2) Goldstone Dry Lake Airport.
- 3) Microwave Test Facility and Fire Training Area.

Photographs and locations of electrical equipment and structures that were involved in the PCB-abatement program at three miscellaneous sites are presented in the following pages.

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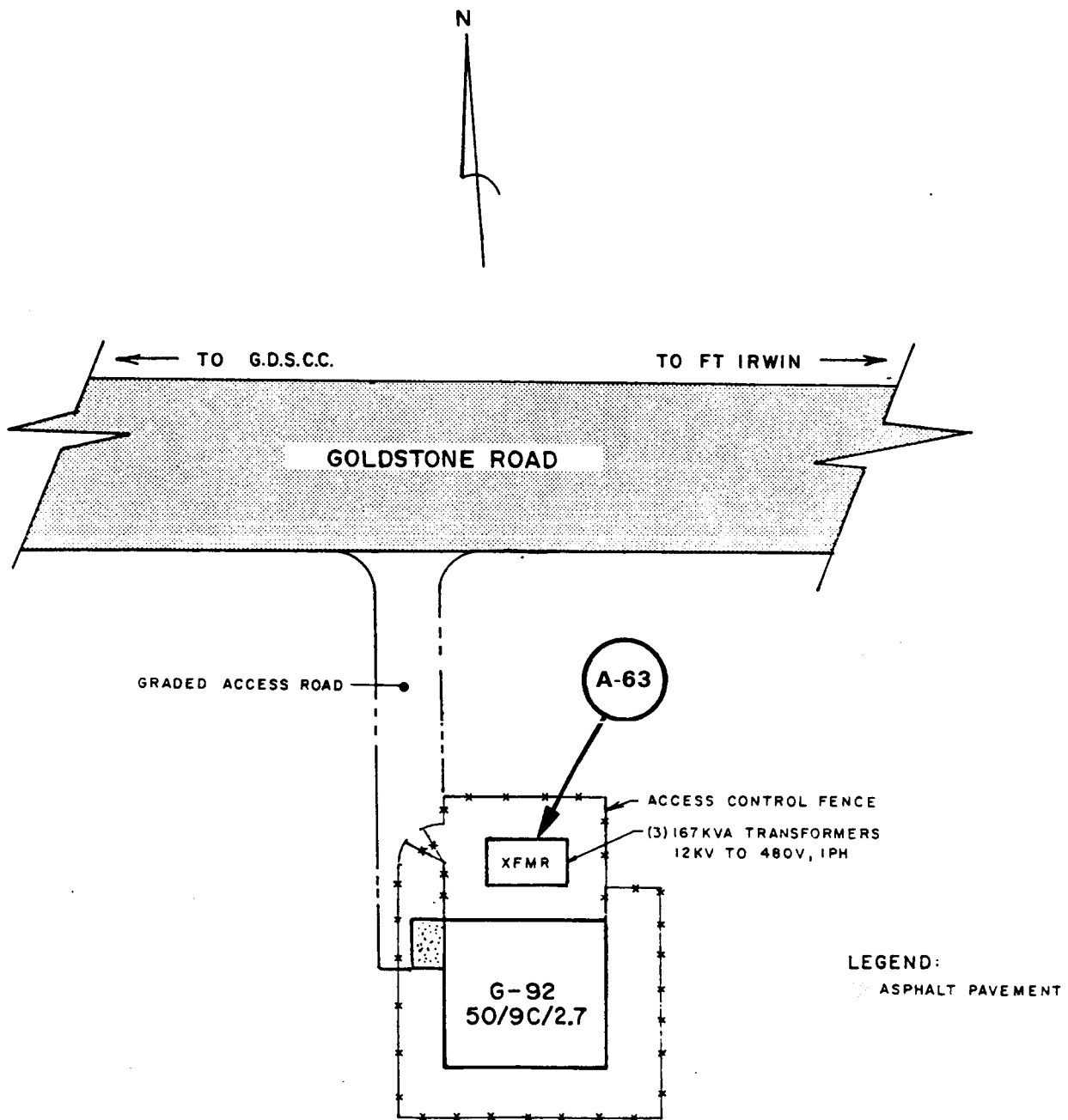


Figure A-62. Goldstone Complex Pump House: Plot Plan

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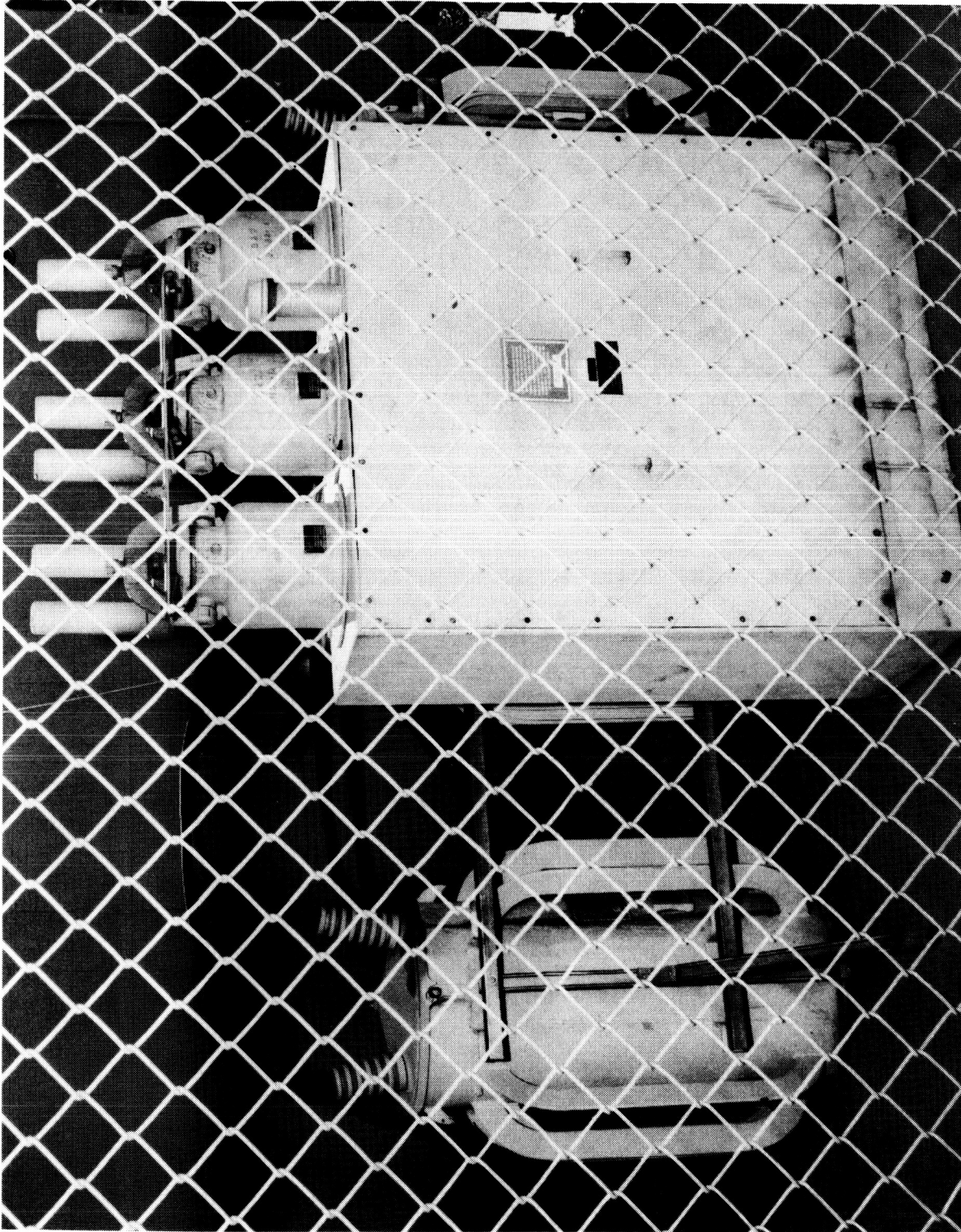


Figure A-63. Transformer in Pump House located between Goldstone and Ft. Irwin

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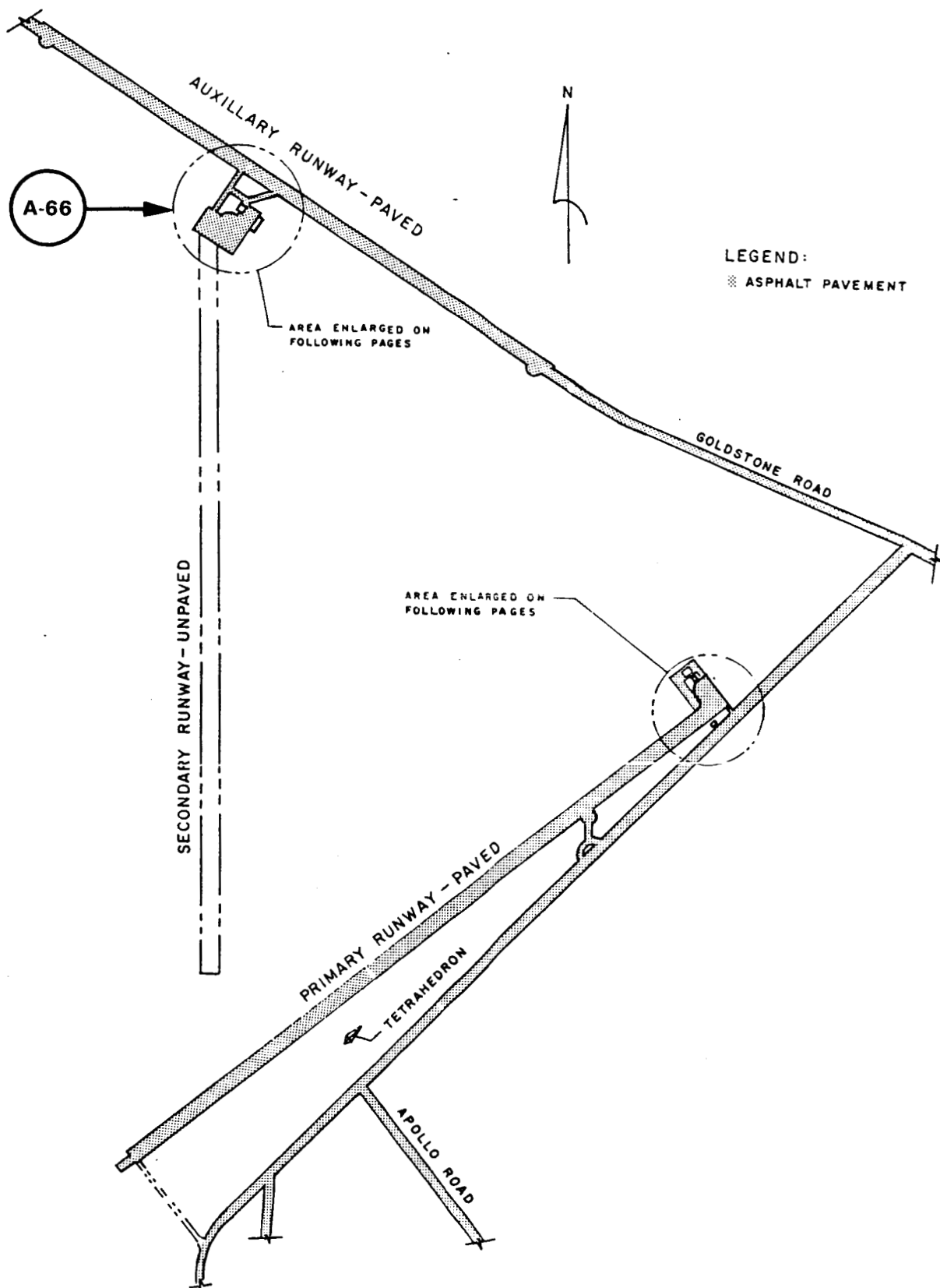


Figure A-64. Goldstone Dry Lake Airport: Plot Plan

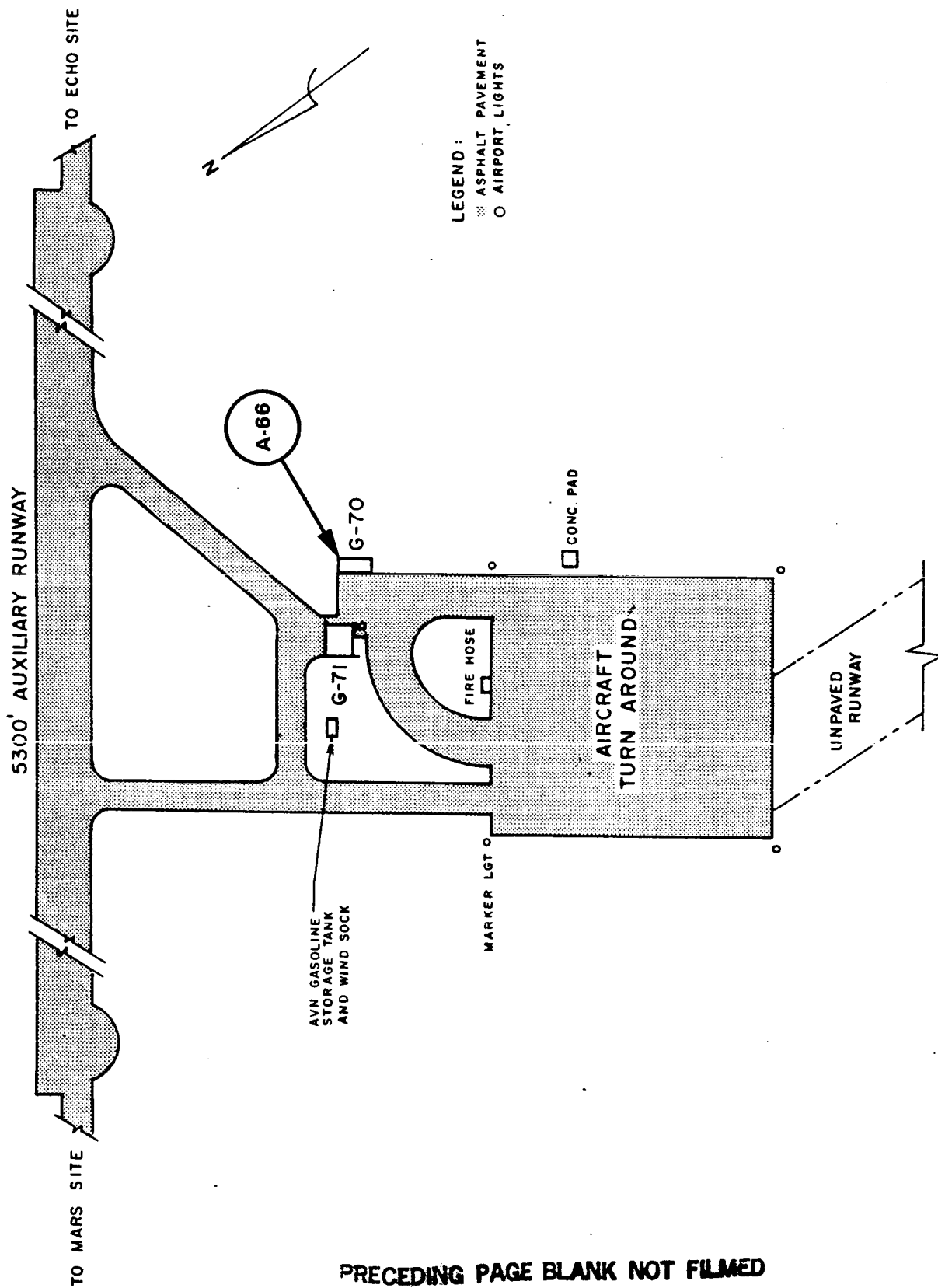


Figure A-65. Goldstone Dry Lake Airport Terminal: Unpaved Runway



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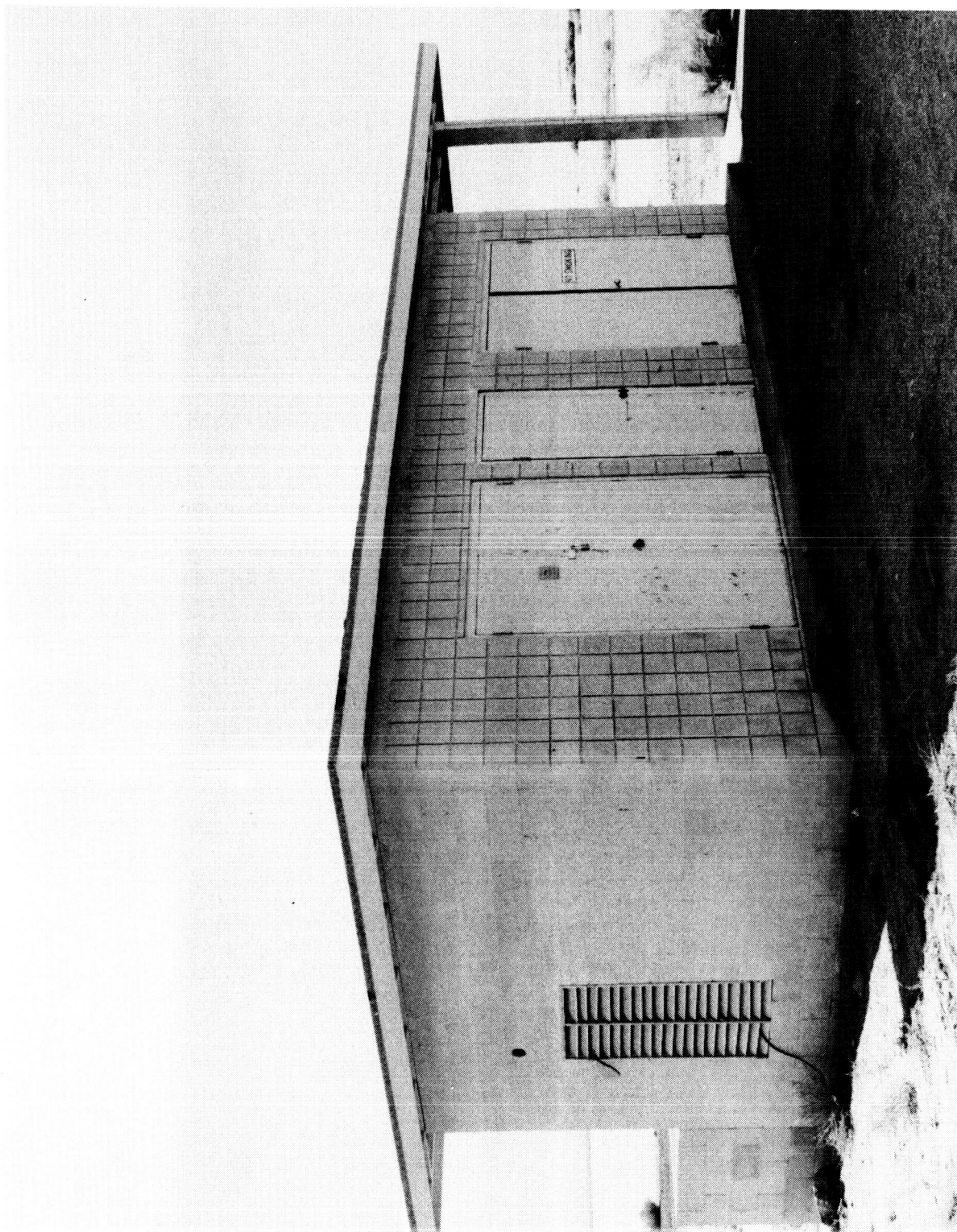


Figure A-66. Building at Airport for Temporary Storage of PCB-Equipment marked for Disposal, Bldg. G-70

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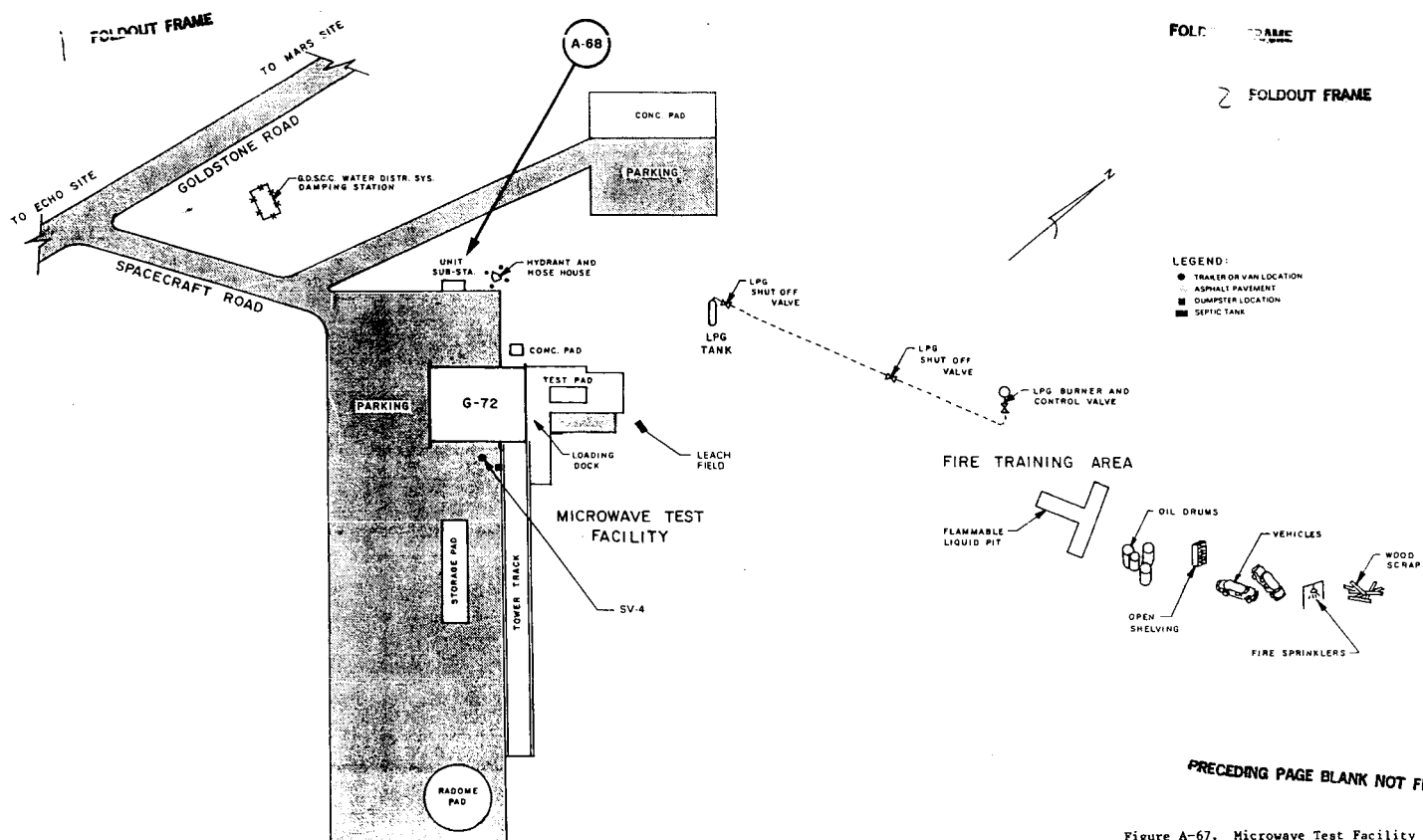


Figure A-67. Microwave Test Facility and Fire Training Area: Plot Plan



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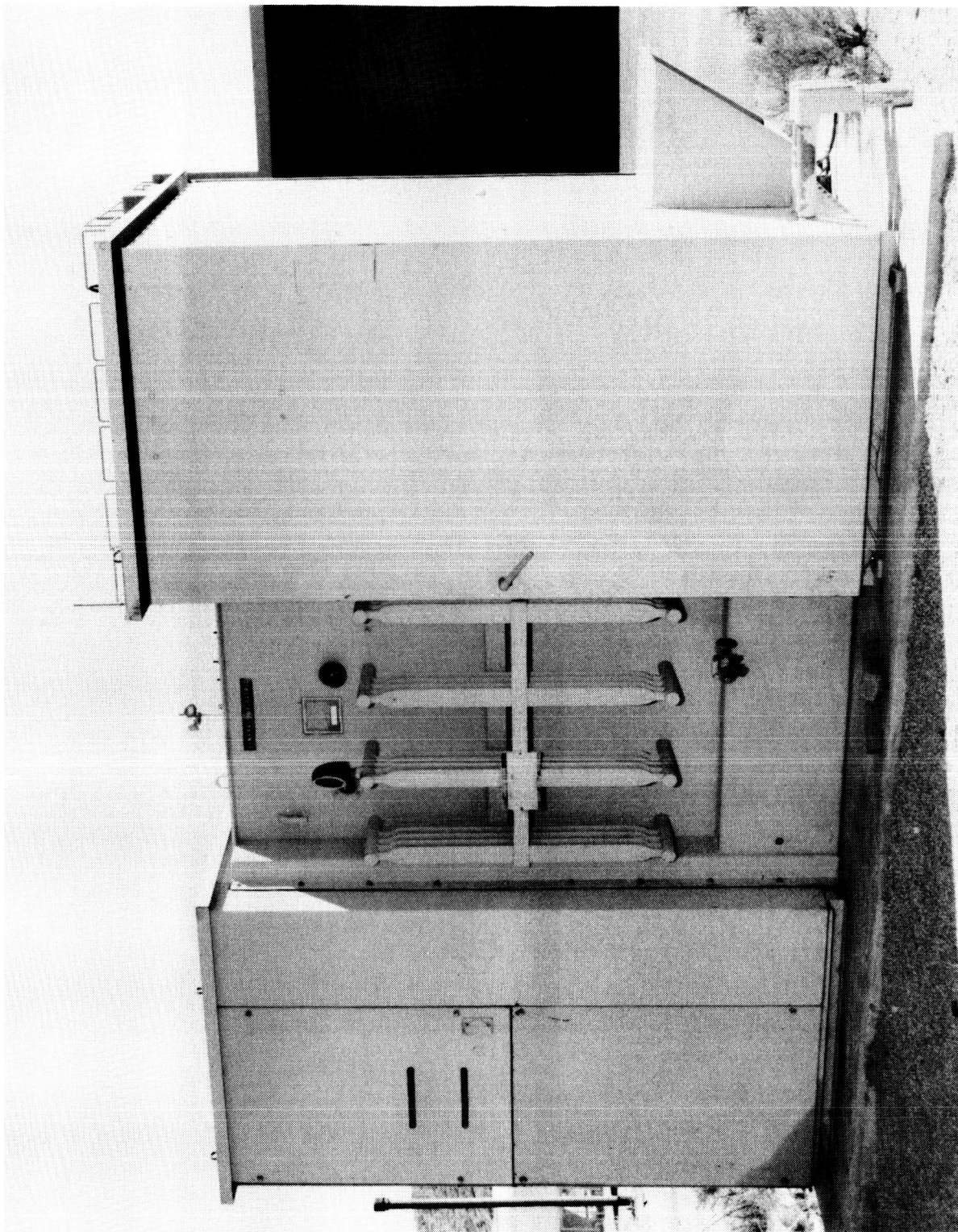


Figure A-68. Transformer at Unit Substation: Microwave Test Facility and Fire Training Area, Outside of Bldg. G-72

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**APPENDIX B**

**MANIFESTS AND DISPOSAL CERTIFICATES CONCERNING FINAL DISPOSITION  
OF PCB-CONTAMINATED EQUIPMENT REMOVED FROM THE  
GOLDSTONE DEEP SPACE COMMUNICATIONS COMPLEX**

GENERAL ELECTRIC COMPANY  
AMPEHEIM DECOM FACILITY  
PCB LOG REPORT  
10/02/86  
PAGE NO. 1

Job Numbers: 74126?  
FSR Numbers: ALL  
Customer Numbers: ALL

| ITEM NO.  | DESCRIPTION                                 | WEIGHT LBS | DATE KGS O/S | DATE RECEIVED | DATE SHIPPED | DISPOSAL FACILITY | LOCATION  | DATE MANIFEST #    | DATE BURNED |
|-----------|---|------------|--------------|---------------|--------------|-------------------|-----------|--------------------|-------------|
| 74126A    | FSR NO: JET PROPULSION LABS                 | PASADENA   |              | (818)577-9862 |              |                   | 84718271  |                    |             |
| 001       | L10 <25K PCB CONT. SOLVENT                  | 670        | 305          | 01/12/86      | 02/02/86     | 07/08/86          | US POLLUT | 84818676           |             |
| 002       | S-DR <25K DEBRIS, CONCRETE                  | 500        | 227          | 02/12/86      | 02/02/86     | 03/03/86          | ENVIROSAF | BOISE 84718237     | #####       |
| 003       | S-DR <25K DEBRIS, CONCRETE                  | 500        | 227          | 02/12/86      | 02/02/86     | 07/08/86          | ENVIROSAF | BOISE 84818878     | #####       |
| 004       | S-DR <25K DEBRIS, CONCRETE                  | 500        | 227          | 02/12/86      | 02/02/86     | 03/03/86          | ENVIROSAF | BOISE 84718237     | #####       |
| 005       | S-DR <25K DEBRIS, CONCRETE                  | 500        | 227          | 02/12/86      | 02/02/86     | 03/03/86          | ENVIROSAF | BOISE 84718237     | #####       |
| 006       | S-DR <25K DEBRIS, CONCRETE                  | 500        | 227          | 02/12/86      | 02/02/86     | 03/03/86          | ENVIROSAF | BOISE 84718237     | #####       |
| 007       | S-DR <25K DEBRIS                            | 102        | 46           | 02/12/86      | 02/02/86     | 07/29/86          | ENVIROSAF | BOISE 84818801     | #####       |
| 74126B    | FSR NO: JET PROPULSION LABS                 | PASADENA   |              | (818)577-9862 |              |                   | 84718274  |                    |             |
| 001       | XFMR >25K WES 30 F 28 PXP17671              | 720        | 327          | 03/28/86      | 03/28/86     | 04/09/86          | ENVIROSAF | BOISE 84664640     | #####       |
| 002       | CAP-B >25K 57 CAPS IN BOXES                 | 1200       | 545          | 03/28/86      | 03/28/86     | 05/16/86          | ENSCO - C | EL DORADO AR-88009 |             |
| 003       | CAP-B >25K 57 CAPS IN BOXES                 | 1200       | 545          | 03/28/86      | 03/28/86     | 05/16/86          | ENSCO - C | EL DORADO AR-88009 |             |
| 004       | CAP-B >25K 57 CAPS IN BOXES IN 126B-02 & 03 | 0          | 0            | 03/28/86      | 03/28/86     | 05/16/86          | ENSCO - C | EL DORADO AR-88009 |             |
| 005       | XFMR <500 WES 15 F 5 61M947                 | 145        | 66           | 03/28/86      | 03/28/86     | 04/09/86          | ENVIROSAF | BOISE 84664640     | #####       |
| 6537 2971 |   |            |              |               |              |                   |           |                    |             |

- ① GE job number and source of material
- ② Type and quantity of material
- ③ same as 1.
- ④ same as 2.
- ⑤ Incoming manifest number
- ⑥ Outgoing manifest number

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State of California—Health and Welfare Agency

Department of Health Services  
Toxic Substances Control Division  
Sacramento, California

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|   |  |   |  |                       |  |   |  |  |  |                                    |  |                  |  |
|---|--|---|--|-----------------------|--|---|--|--|--|------------------------------------|--|------------------|--|
| <b>UNIFORM HAZARDOUS WASTE MANIFEST</b>   |  | 1. Generator's US EPA ID No.<br>CAJ7800020391 |  | Manifest Document No. |  | 2. Page 1 of 1                                |  | Information in the shaded areas is not required by Federal law |  |                                    |  |                  |  |
| 3. Generator's Name and Mailing Address<br>JET PROPULSION LABORATORY<br>4800 OAK GROVE DR., PASADENA, CA 91109  |  |   |  |                       |  | A.State Manifest Document Number<br>84718274  |  |  |  |                                    |  |                  |  |
| 4. Generator's Phone (818) 577-9868 LEN KUSHNER   |  |   |  |                       |  | B.State Generator's ID<br>CAJ-7800020391 6495 |  |  |  |                                    |  |                  |  |
| 5. Transporter 1 Company Name<br>GENERAL ELECTRIC CO  |  |   |  |                       |  | C.State Transporter's ID<br>CAJ030584502      |  |  |  |                                    |  |                  |  |
| 6. US EPA ID Number<br>CAJ030584502   |  |   |  |                       |  | D.Transporter's Phone (714) 630-4111          |  |  |  |                                    |  |                  |  |
| 7. Transporter 2 Company Name   |  |   |  |                       |  | E.State Transporter's ID                      |  |  |  |                                    |  |                  |  |
| 8. US EPA ID Number   |  |   |  |                       |  | F.Transporter's Phone                         |  |  |  |                                    |  |                  |  |
| 9. Designated Facility Name and Site Address<br>GENERAL ELECTRIC CO<br>3601 LAPALMA AVE. ANAHEIM, CA  |  |   |  |                       |  | G.State Facility's ID<br>CAJ030584502         |  |  |  |                                    |  |                  |  |
| 10. US EPA ID Number<br>CAJ030584502  |  |   |  |                       |  | H.Facility's Phone<br>(714) 630-4111          |  |  |  |                                    |  |                  |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  |   |  |                       |  | 12. Containers No. Type                       |  | 13. Total Quantity   |  | 14. Unit Wt/Vol                    |  | 15. Waste No.    |  |
| a.WASTE POLYCHLORINATED BIPHENYLS @<br>ORME; UN 2315 -  |  |   |  |                       |  | 1   |  | CM   |  | 1800                               |  | P 261            |  |
| b.WASTE POLYCHLORINATED BIPHENYLS<br>ORM-E, UN 2315   |  |   |  |                       |  | 3   |  | CW   |  | 1895                               |  | P 261            |  |
| c.WASTE POLYCHLORINATED BIPHENYLS<br>ORM-E, UN 2315   |  |   |  |                       |  | 1   |  | CM   |  | 200                                |  | P 261            |  |
| d.  |  |   |  |                       |  |   |  |  |  |                                    |  |                  |  |
| 16. Additional Descriptions for Materials Listed Above  |  |   |  |                       |  | K.Handling Codes for Wastes Listed Above      |  |  |  |                                    |  |                  |  |
| a. TRANSFORMER S/N PXP17671   |  |   |  |                       |  | 14  |  |  |  |                                    |  |                  |  |
| b. (57) CAPACITORS  |  |   |  |                       |  |   |  |  |  |                                    |  |                  |  |
| c. TRANSFORMED MINERAL OIL >50PPM PCB S/N 61M947  |  |   |  |                       |  |   |  |  |  |                                    |  |                  |  |
| 15. Special Handling Instructions and Additional Information  |  |   |  |                       |  |   |  |  |  |                                    |  |                  |  |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |   |  |                       |  |   |  |  |  |                                    |  |                  |  |
| Printed/Typed Name<br>William A. Neffsinger   |  |   |  |                       |  |   |  |  |  | Signature<br>William A. Neffsinger |  | Date<br>3/23/86  |  |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  |   |  |                       |  |   |  |  |  | Signature<br>LORRELL MARTIN        |  | Date<br>03/27/86 |  |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  |   |  |                       |  |   |  |  |  | Signature                          |  | Date             |  |
| Printed/Typed Name  |  |   |  |                       |  |   |  |  |  | Signature                          |  | Date             |  |
| 19. Discrepancy Indication Space<br>UNLINED TO 3-31-86  |  |   |  |                       |  |   |  |  |  |                                    |  |                  |  |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |   |  |                       |  |   |  |  |  |                                    |  |                  |  |
| Printed/Typed Name  |  |   |  |                       |  |   |  |  |  | Signature                          |  | Date             |  |

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Department of Health Services  
Toxic Substances Control Division  
Sacramento, California

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+ 4550

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| UNIFORM HAZARDOUS WASTE MANIFEST  |  | 1. Generator's US EPA ID No.                    | Manifest Document No. | 2. Page 1 of 1                                | Information in the shaded areas is not required by Federal law |               |
|---|--|---|-----------------------|---|--|---------------|
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA AVENUE<br>ANAHEIM, CA 92806   |  | 4. Generator's Phone (714) 630-4111             |                       | A. State Manifest Document Number<br>84664640 |  |               |
| 5. Transporter 1 Company Name<br>DART TRUCKING COMPANY, INC.  |  | 6. US EPA ID Number<br>10 H D 3 0 9 2 6 5 8 2   |                       | C. State Transporter's ID<br>18210            |  |               |
| 7. Transporter 2 Company Name   |  | 8. US EPA ID Number<br>10 H D 3 0 9 2 6 5 8 2   |                       | D. Transporter's Phone<br>209/238-5357        |  |               |
| 9. Designated Facility Name and Site Address<br>ENVIROSAFE SERVICES OF IDAHO<br>10.5 MILES N.W. OF GRANDVIEW<br>GRANDVIEW, IDAHO  |  | 10. US EPA ID Number<br>10 H D 3 0 9 2 6 5 8 2  |                       | E. State Transporter's ID<br>18210            |  |               |
|   |  |   |                       | F. Transporter's Phone                        |  |               |
|   |  |   |                       | G. State Facility's ID<br>10007311454         |  |               |
|   |  |   |                       | H. Facility's Phone                           |  |               |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers No.                              | Type                  | 13. Total Quantity                            | 14. Unit Wt/Vol  | 15. Waste No. |
| a. WASTE POLYCHLORINATED BIPHENYLS, (RQ 10/5.450)<br>ORM-E UN2315 (TRANSFORMERS)  |  | 0 1 1   | C-M                   | 0 2 2 730                                     | P  | 731           |
| b. WASTE POLYCHLORINATED BIPHENYLS, (RQ 10/5.45)<br>ORM-E UN2315 (DEBRIS)   |  | 0 0 8   | D-M                   | 0 0 2 400                                     | P  | 731           |
| c. WASTE FLAMMABLE SOLIDS (FORMERLY LIQUIDS)<br>FLAMMABLE LIQUIDS (NOW SOLIDS) NA1263   |  | 0 0 4   | D-M                   | 0 0 1 200                                     | P  | 513           |
| d.  |  |   |                       |   |  |               |
| j. Additional Descriptions for Materials Listed Above<br>11c. CRUSHED, DRAINED, DEPRESSURIZED AEROSOL CANS<br>CONTAINED PAINTS OR OTHER FLAMMABLES  |  | k. Handling Codes for Wastes Listed Above<br>03 |                       |   |  |               |
| 15. Special Handling Instructions and Additional Information<br>ORM-E NOT FLAMMABLE: NO FREE-STANDING LIQUIDS IN ANY CONTAINERS   |  |   |                       |   |  |               |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |   |                       |   |  |               |
| Printed/Typed Name<br>LOUISE SAH  |  | Signature<br><i>[Signature]</i>                 |                       | Date<br>4 4 86                                |  |               |
| 17. Transporter 1 Acknowledgement of Receipt of Materials<br>Printed/Typed Name<br>FLOYD GIBSON   |  | Signature<br><i>[Signature]</i>                 |                       | Date<br>4 4 86                                |  |               |
| 18. Transporter 2 Acknowledgement of Receipt of Materials<br>Printed/Typed Name   |  | Signature                                       |                       | Date  |  |               |
| 19. Discrepancy Indication Space  |  |   |                       |   |  |               |
| Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.  |  |   |                       |   |  |               |
| Printed/Typed Name<br>CAROL PRICE   |  | Signature<br><i>[Signature]</i>                 |                       | Date<br>14 11 86                              |  |               |

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Department of Pollution Control and Ecology  
P. O. Box 9583 Little Rock, Arkansas 72219  
Telephone 501-562-7444

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Form Approved. OMB No. 2000-0404. Expires 7-31-85

| UNIFORM HAZARDOUS WASTE MANIFEST  |  | 1. Generator's US EPA ID No                      | Manifest Document No | 2. Page 1 of 1                                 | Information in the shaded areas is not required by Federal law. |              |
|---|--|--|----------------------|--|---|--------------|
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA AVENUE<br>ANAHEIM, CA 92806, 714/630-4111   |  | C A 10 0 3 0 5 8 4 5 0 2 7 4 0 1 1               |                      | A. State Manifest Document Number<br>AR- 88009 |   |              |
| 5. Transporter 1 Company Name<br>DART TRUCKING COMPANY, INC.  |  | 0 H 10 0 0 9 8 6 5 8 2 5                         |                      | B. State Generator's ID<br>CAD030584502        |   |              |
| 7. Transporter 2 Company Name   |  |  |                      | C. State Transporter's ID<br>701896            |   |              |
| 9. Designated Facility Name and Site Address<br>ENSCO, INC.<br>47TH & SMITH AVENUES<br>EL DORADO, ARKANSAS 71730  |  | 10 US EPA ID Number                              |                      | D. Transporter's Phone<br>800/238-8357         |   |              |
|   |  |  |                      | E. State Transporter's ID                      |   |              |
|   |  |  |                      | F. Transporter's Phone                         |   |              |
|   |  |  |                      | G. State Facility's ID<br>AR0000404PCB         |   |              |
|   |  |  |                      | H. Facility's Phone<br>501/375-8444 862-7663   |   |              |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers No.                               | Type                 | 13. Total Quantity                             | 14. Unit Wt/Vol   | I. Waste No. |
| a. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315 (CAPACITORS)   |  | 0 0 2  | D M                  | 0 0 5 7 0                                      | P   | PCB          |
| b. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315 (CAPACITORS)   |  | 0 0 2  | C W                  | 0 0 2600                                       | P   | PCB          |
| c.  |  |  |                      |  |   |              |
| d.  |  |  |                      |  |   |              |
| J. Additional Descriptions for Materials Listed Above   |  | K. Handling Codes for Wastes Listed Above<br>PCB |                      |  |   |              |
| if no alternate TSDF, return to generator   |  |  |                      |  |   |              |
| 15. Special Handling Instructions and Additional Information<br>EMERGENCY CONTACT: LOUISE SAH 714/630-4111 or 714/777-4376<br>P.O. 051-74089-0  |  |  |                      |  |   |              |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and Arkansas state regulations. Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment. |  |  |                      |  |   |              |
| Printed/Typed Name<br>Louise Sah  |  | Signature<br>Louise Sah                          |                      | Month Day Year<br>05 14 86                     |   |              |
| 17. Transporter 1 Acknowledgement of Receipt of Materials<br>Printed/Typed Name<br>Ken Van Leuven   |  | Signature<br>Ken Van Leuven                      |                      | Month Day Year<br>05 14 86                     |   |              |
| 18. Transporter 2 Acknowledgement of Receipt of Materials<br>Printed/Typed Name   |  | Signature  |                      | Month Day Year                                 |   |              |
| 19. Discrepancy Indication Space<br>Enco WP 3905 H-205 trans add<br>PC-902 P.O. Box 89<br>Canton, OH  |  |  |                      |  |   |              |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19<br>Printed/Typed Name<br>Loise Andrus   |  | Signature<br>Loise Andrus                        |                      | Month Day Year<br>05 14 86                     |   |              |

EPA Form 8700-22 (Rev. 4-85) Previous edition is obsolete.

NOTICE: THE ORIGINAL AND NOT LESS THAN TWO (2) COPIES MUST MOVE WITH THE HAZARDOUS WASTE SHIPMENT. ONCE DELIVERED THE TREATMENT STORAGE DISPOSAL FACILITY MUST RETURN THIS ORIGINAL COPY TO THE GENERATOR.

GENERAL ELECTRIC COMPANY  
ANAHEIM DECOM FACILITY  
PCB LOG REPORT  
10/02/86  
PAGE NO. 1

Job Numbers: 74140?  
FSR Numbers: ALL  
Customer Numbers: ALL

| ITEM  | DESCRIPTION |      |                     |     |   |                | WEIGHT   | DATE | DATE          | DISPOSAL |          | DATE              |                    |        |
|-------|-------------|------|---------------------|-----|---|----------------|----------|------|---------------|----------|----------|-------------------|--------------------|--------|
| NO.   | TYPE        | PPM  | MAKE                | KVA | T | SAL SERIAL NO. | LBS      | KGS  | O/S           | RECEIVED | SHIPPED  | FACILITY LOCATION | MANIFEST #         | BURNED |
| 74140 | FSR NO:     |      | JET PROPULSION LABS |     |   |                | PASADENA |      | (818)577-9862 |          |          | 84664632          |                    |        |
| 001   | CAP-D       | >25K | CAP                 |     |   | IN 126B-02-03  | 34       | 15   | 03/20/86      | 03/20/86 | 05/16/86 | ENSCO - C         | EL DORADO AR-88009 |        |
| 002   | CAP-D       | >25K | CAP                 |     |   | IN 126B-02,03  | 34       | 15   | 03/20/86      | 03/20/86 | 05/16/86 | ENSCO - C         | EL DORADO AR-88009 |        |
| 003   | CAP-D       | >25K | CAP                 |     |   | IN 126B-02,03  | 34       | 15   | 03/20/86      | 03/20/86 | 05/16/86 | ENSCO - C         | EL DORADO AR-88009 |        |
| 004   | CAP-D       | >25K | CAP                 |     |   | IN 126B-02,03  | 34       | 15   | 03/20/86      | 03/20/86 | 05/16/86 | ENSCO - C         | EL DORADO AR-88009 |        |
| 005   | CAP-D       | >25K | CAP                 |     |   | IN 126B-02,03  | 34       | 15   | 03/20/86      | 03/20/86 | 05/16/86 | ENSCO - C         | EL DORADO AR-88009 |        |
| 006   | CAP-D       | >25K | CAP                 |     |   | IN 126B-02,03  | 34       | 15   | 03/20/86      | 03/20/86 | 05/16/86 | ENSCO - C         | EL DORADO AR-88009 |        |
|       |             |      |                     |     |   |                | 204      | 93   |               |          |          |                   |                    |        |

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STATE OF ARKANSAS  
Department of Pollution Control and Ecology  
P. O. Box 9583 Little Rock, Arkansas 72219  
Telephone 501-562-7444

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Form Approved OMB No. 2000-0404 Expires 7-31-85

| UNIFORM HAZARDOUS WASTE MANIFEST  |  | 1. Generator's US EPA ID No.                     | Manifest Document No. | 2. Page 1 of 1                                 | Information in the shaded areas is not required by Federal law. |  |
|---|--|--|-----------------------|--|---|--|
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA AVENUE<br>ANAHEIM, CA 92806 714/630-4111  |  | C A D 0 3 0 5 8 4 5 0 2 7 4 0 1 1                |                       | A. State Manifest Document Number<br>AR- 88009 |   |  |
| 5. Transporter 1 Company Name<br>DART TRUCKING COMPANY, INC.  |  | 8. US EPA ID Number<br>0 H D 0 0 9 8 6 5 8 2 5   |                       | C. State Transporter's ID<br>701896            |   |  |
| 7. Transporter 2 Company Name   |  | 8. US EPA ID Number                              |                       | D. Transporter's Phone<br>800/238-8357         |   |  |
| 9. Designated Facility Name and Site Address<br>ENSCO, INC.<br>47TH & SMITH AVENUES<br>EL DORADO, ARKANSAS 71730  |  | 10. US EPA ID Number                             |                       | E. State Transporter's ID                      |   |  |
|   |  |  |                       | F. Transporter's Phone                         |   |  |
|   |  |  |                       | G. State Facility's ID<br>AR0000404PCB         |   |  |
|   |  |  |                       | H. Facility's Phone<br>501/375-8444 862-1663   |   |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers                                   | 13. Total Quantity    | 14. Unit Wt/Vol                                | 15. Waste No.   |  |
| a. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315 (CAPACITORS)   |  | 0 0 2 D M  | 0 0 5 7 0             | P  | PCB   |  |
| b. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315 (CAPACITORS)   |  | 0 0 2 C W  | 0 0 2 6 0 0           | P  | PCB   |  |
| c.  |  |  |                       |  |   |  |
| d.  |  |  |                       |  |   |  |
| J. Additional Descriptions for Materials Listed Above   |  | K. Handling Codes for Wastes Listed Above<br>PCB |                       |  |   |  |
| if no alternate TSDF, return to generator   |  |  |                       |  |   |  |
| 15. Special Handling Instructions and Additional Information<br>EMERGENCY CONTACT: LOUISE SAH 714/630-4111 or 714/777-4376<br>P.O. 051-74089-0  |  |  |                       |  |   |  |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and Arkansas state regulations. Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment. |  |  |                       |  |   |  |
| Printed/Typed Name<br>Louise Sah  |  | Signature<br>Louise Sah                          |                       | Month Day Year<br>05/16/86                     |   |  |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  | Signature<br>Ken Van Leuven                      |                       | Month Day Year<br>05/16/86                     |   |  |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  | Signature  |                       | Month Day Year                                 |   |  |
| 19. Discrepancy Indication Space<br>Enoco WP 3905<br>H-205<br>PC-902<br>trans 200<br>P.O. Box 89<br>Canton, OH  |  |  |                       |  |   |  |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.  |  | Signature<br>Dave Anderson                       |                       | Month Day Year<br>05/16/86                     |   |  |

Form 8700-22 (Rev. 4-85) Previous Edition is obsolete



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State of California—Health and Welfare Agency

Department of Health Services  
Toxic Substances Control Division  
Sacramento, California

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|   |  |   |  |   |  |   |  |  |  |
|---|--|---|--|---|--|---|--|--|--|
| <b>UNIFORM HAZARDOUS<br/>WASTE MANIFEST</b>   |  | 1. Generator's US EPA ID No.<br>CAD 7-0002039-1   |  | Manifest Document No.<br>17414          |  | 2. Page 1<br>of 1                             |  | Information in the shaded areas<br>is not required by Federal<br>law.  |  |
|   |  | 3. Generator's Name and Mailing Address<br>JET PROPULSION LABORATORIES<br>4800 OAK GROVE DRIVE BG 511 RM 200 PASADENA, CA |  | 4. Generator's Phone ( 818 ) 354-3013   |  | 5. State Manifest Document Number<br>84664632 |  | 6. State Generator's ID<br>CAD700020391  |  |
| 5. Transporter 1 Company Name<br>GENERAL ELECTRIC COMPANY   |  | 6. US EPA ID Number<br>CAD030584502   |  | 7. State Transporter's ID<br>74952      |  | 8. Transporter's Phone<br>714/630-4111        |  | 9. State Transporter's ID<br>714/630-4111  |  |
| 7. Transporter 2 Company Name   |  | 8. US EPA ID Number   |  | 9. State Transporter's ID               |  | 10. Transporter's Phone                       |  | 11. State Transporter's ID   |  |
| 9. Designated Facility Name and Site Address<br>GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA AVENUE<br>ANAHEIM, CA 92806  |  | 10. US EPA ID Number<br>CAD030584502  |  | 11. State Facility's ID<br>CAD030584502 |  | 12. Facility's Phone<br>714/630-4111          |  | 13. State Facility's ID  |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers<br>No. Type  |  | 13. Total<br>Quantity                   |  | 14. Unit<br>Wt/Vol                            |  | 15. Waste No.  |  |
| a. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315 (CAPACITORS)   |  | 206 1400080   |  | P                                       |  | 261   |  | 16. Additional Descriptions for Materials Listed Above<br>SH PERMIT NO. 3-8242   |  |
| b.  |  | 17. Containers  |  | 18. Total                               |  | 19. Unit                                      |  | 20. Waste No.  |  |
| c.  |  | 21. Containers  |  | 22. Total                               |  | 23. Unit                                      |  | 24. Waste No.  |  |
| d.  |  | 25. Containers  |  | 26. Total                               |  | 27. Unit                                      |  | 28. Waste No.  |  |
| 15. Special Handling Instructions and Additional Information<br>EXTREMELY HAZARDOUS: HANDLE WITH COMMENSURATE CARE  |  |   |  |   |  |   |  |  |  |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |   |  |   |  |   |  |  |  |
| Printed/Typed Name<br>K. A. MITCHELL  |  |   |  | Signature<br><i>[Signature]</i>         |  | Date<br>3/1/84                                |  | 17. Transporter 1 Acknowledgement of Receipt of Materials  |  |
| Printed/Typed Name<br><i>[Signature]</i>  |  |   |  | Signature<br><i>[Signature]</i>         |  | Date<br>3/1/84                                |  | 18. Transporter 2 Acknowledgement of Receipt of Materials  |  |
| Printed/Typed Name  |  |   |  | Signature                               |  | Date  |  | 19. Discrepancy Indication Space   |  |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |   |  |   |  |   |  |  |  |
| Printed/Typed Name  |  |   |  | Signature                               |  | Date  |  | 21. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. |  |
| Printed/Typed Name  |  |   |  | Signature                               |  | Date  |  | 22. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. |  |

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PA 3700-221

YELLOW: GENERATOR RETAINS

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GENERAL ELECTRIC COMPANY  
ANAHEIM DECOM FACILITY  
PCB LOG REPORT  
10/02/86  
PAGE NO. 1

Job Numbers: 74086?  
FSR Numbers: ALL  
Customer Numbers: ALL

| EM      | DESCRIPTION |                     |                     |     |                | WEIGHT   | DATE | DATE          | DISPOSAL |          | DATE      |                    |            |        |
|---------|-------------|---------------------|---------------------|-----|----------------|----------|------|---------------|----------|----------|-----------|--------------------|------------|--------|
| O. TYPE | PPM         | MAKE                | KVA                 | T   | GAL SERIAL NO. | LBS      | KGS  | O/S           | RECEIVED | SHIPPED  | FACILITY  | LOCATION           | MANIFEST # | BURNED |
| 086     | FSR NO:     |                     | JET PROPULSION LABS |     |                | PASADENA |      | (818)577-9862 |          |          | 84043456  |                    |            |        |
| 001     | XFMR        | >25K UNK            | M                   | 100 | E-693130       | 2600     | 1182 | 11/07/85      | 11/07/85 | 11/14/85 | CHEMICAL  | KETTLEMAN CI       | 84885683   | *****  |
| 002     | LIQ         | >25K PCB LIQUID     |                     |     |                | 625      | 284  | 11/07/85      | 11/07/85 | 11/22/85 | ENSCO - L | EL DORADO AR-75945 | 12/30/85   |        |
| 003     | LIQ         | >25K PCB LIQUID     |                     |     |                | 625      | 284  | 11/07/85      | 11/07/85 | 11/22/85 | ENSCO - L | EL DORADO AR-75945 | 12/30/85   |        |
| 004     | S-DR        | >25K DEBRIS         |                     |     |                | 300      | 136  | 11/07/85      | 11/07/85 | 03/03/86 | ENVIROSAF | BOISE 84718237     | *****      |        |
| 005     | S-DR        | >25K DEBRIS         |                     |     |                | 300      | 136  | 11/07/85      | 11/07/85 | 03/03/86 | ENVIROSAF | BOISE 84718237     | *****      |        |
| 006     | S-DR        | >25K DEBRIS         |                     |     |                | 300      | 136  | 11/07/85      | 11/07/85 | 03/03/86 | ENVIROSAF | BOISE 84718237     | *****      |        |
| 007     | S-DR        | >25K DEBRIS         |                     |     |                | 300      | 136  | 11/07/85      | 11/07/85 | 03/03/86 | ENVIROSAF | BOISE 84718237     | *****      |        |
| 008     | SOLID       | <25K 97 EMPTY DRUMS |                     |     |                | 4850     | 2205 | 11/07/85      | 11/07/85 | 11/07/85 | ANAHEIM D | ANAHEIM 74086      | *****      |        |
| 001     | LIQ         | <25K FLUSH FLUID    |                     |     |                | 625      | 284  | 11/07/85      | 11/07/85 | 11/22/85 | ENSCO - L | EL DORADO AR-75945 | 12/30/85   |        |
|         |             |                     |                     |     |                | 10525    | 4784 |               |          |          |           |                    |            |        |

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State of California—Health and Welfare Agency

Department of Health Services  
Toxic Substances Control Division  
Sacramento, California

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| UNIFORM HAZARDOUS WASTE MANIFEST  |  | 1. Generator's US EPA ID No.<br>CAD700020391 | Manifest Document No. | 2. Page 1 of                                  | Information in the shaded areas is not required by Federal law |               |
|---|--|--|-----------------------|---|--|---------------|
| 3. Generator's Name and Mailing Address<br>EXPLOSION LABORATORY<br>4500 OAKGROVE<br>CASADENA, CA 91109  |  | 6. US EPA ID Number<br>CAT080034.259         |                       | A. State Manifest Document Number<br>84043456 |  |               |
| 4. Generator's Phone (813) 1577 9231  |  | 8. US EPA ID Number                          |                       | B. State Generator's ID<br>CAD700020391       |  |               |
| 5. Transporter 1 Company Name<br>US SERVICES  |  | 10. US EPA ID Number                         |                       | C. State Transporter's ID<br>66284            |  |               |
| 7. Transporter 2 Company Name   |  |  |                       | D. Transporter's Phone<br>714 371-4461        |  |               |
| 9. Designated Facility Name and Site Address<br>GENERAL ELECTRIC CO.<br>3601 LA PALMA<br>ANALYST, CA  |  |  |                       | E. State Transporter's ID                     |  |               |
|   |  |  |                       | F. Transporter's Phone                        |  |               |
|   |  |  |                       | G. State Facility's ID                        |  |               |
|   |  |  |                       | H. Facility's Phone<br>714-630-4141           |  |               |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers No.                           | Type                  | 13. Total Quantity                            | 14. Unit Wt/Vol  | 15. Waste No. |
| WASTE POLYCHLORINATED BIPHENYLS<br>ORME RQ UN2315 S/N E693130   |  | 1  | CH                    | 2300  | P  | 261           |
| WASTE POLYCHLORINATED BIPHENYLS<br>ORME RQ UN2315   |  | 4  | DR                    | EST 1500                                      | P  | 261           |
| WASTE POLYCHLORINATED BIPHENYLS<br>ORME RQ UN2315 LIQUID  |  | 2  | DR                    | 1200  | P  | 261           |
| WASTE POLYCHLORINATED BIPHENYLS<br>ORME RQ UN2315 EMPT DRUMS  |  | 97   | DR                    | EST 3880                                      | P  | 261           |
| J. Additional Descriptions for Materials Listed Above   |  | K. Handling Codes for Wastes Listed Above    |                       |   |  |               |
| 15. Special Handling Instructions and Additional Information  |  |  |                       |   |  |               |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |  |                       |   |  |               |
| Printed/Typed Name<br>G. E. L. K. R. L.   |  | Signature<br>[Signature]                     |                       | Date<br>Month Day Year<br>10 11 84            |  |               |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  | Signature<br>[Signature]                     |                       | Date<br>Month Day Year<br>10 11 84            |  |               |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  | Signature<br>[Signature]                     |                       | Date<br>Month Day Year<br>10 11 84            |  |               |
| 3. Discrepancy Indication Space   |  |  |                       |   |  |               |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |  |                       |   |  |               |
| Printed/Typed Name  |  | Signature                                    |                       | Date<br>Month Day Year                        |  |               |

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State of California—Health and Welfare Agency

Department of Health Services  
Toxic Substances Control Division  
Sacramento, California

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|   |  |   |                                  |  |  |
|---|--|---|----------------------------------|--|--|
| UNIFORM HAZARDOUS WASTE MANIFEST  |  | 1. Generator's US EPA ID No.<br>C A D 0 3 0 5 8 4 5 0 2 | Manifest Document No.<br>7 4 0 1 | 2. Page 1 of 1   | Information in the shaded areas is not required by Federal law |
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA ANAHEIM, CA 92806   |  | 6. US EPA ID Number<br>C A D 0 3 0 5 8 4 5 0 2          |                                  | A. State Manifest Document Number<br>84885683  |  |
| 4. Generator's Phone (714) 630-4111   |  |   |                                  | B. State Generator's ID<br>CAD030584502  |  |
| 5. Transporter 1 Company Name<br>GENERAL ELECTRIC COMPANY   |  | 6. US EPA ID Number<br>C A D 0 3 0 5 8 4 5 0 2          |                                  | C. State Transporter's ID<br>65433   |  |
| 7. Transporter 2 Company Name   |  | 8. US EPA ID Number                                     |                                  | D. Transporter's Phone<br>714/530-4111   |  |
| 9. Designated Facility Name and Site Address<br>CHEMICAL WASTE MANAGEMENT, INC.<br>35251 OLD SKYLINE ROAD<br>KETTELMAN CITY, CA 93239   |  | 10. US EPA ID Number<br>C A T 0 0 0 6 4 6 1 1 7         |                                  | E. State Transporter's ID<br>F. Transporter's Phone<br>G. State Facility's ID<br>CAT000645117<br>H. Facility's Phone<br>209/386-9711 |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers No.                                      | Type                             | 13. Total Quantity   | 14. Unit w/vol   |
| a. WASTE POLYCHLORINATED BIPHENYLS, -RQ 10/4.5<br>ORM-E UN2315 (TRANSFORMERS)   |  | 1   | CM                               | 1  | P  |
| b.  |  |   |                                  |  |  |
| c.  |  |   |                                  |  |  |
| d.  |  |   |                                  |  |  |
| J. Additional Descriptions for Materials Listed Above<br>TRANSFORMERS DRAINED AND FLUSHED<br>P.O. 051-74068-10  |  | K. Handling Codes for Wastes Listed Above<br>03         |                                  |  |  |
| 15. Special Handling Instructions and Additional Information<br>EXTREMELY HAZARDOUS: HANDLE WITH COMMENSURATE CARE<br>EXTREMELY HAZARDOUS: HANDLE WITH COMMENSURATE CARE X  |  |   |                                  |  |  |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |   |                                  |  |  |
| Printed/Typed Name<br>LOUISE SAH  |  | Signature<br><i>Louise Sah</i>                          |                                  | Date<br>11/14/85   |  |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  | Signature<br><i>Larry Smith</i>                         |                                  | Date   |  |
| Printed/Typed Name<br>LARRY SMITH   |  | Signature   |                                  | Month Day Year   |  |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  | Signature   |                                  | Date   |  |
| Printed/Typed Name  |  | Signature   |                                  | Month Day Year   |  |
| 19. Discrepancy Indication Space  |  |   |                                  |  |  |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |   |                                  |  |  |
| Printed/Typed Name<br>S. J. James   |  | Signature<br><i>S. J. James</i>                         |                                  | Date<br>Month Day Year   |  |

IHS 8022 A (11/84)  
PA 8700-22)

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84-275-1

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STATE OF ARKANSAS  
Department of Pollution Control and Ecology  
P. O. Box 9583 Little Rock, Arkansas 72219  
Telephone 501-562-7444

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Form Approved, OMB No. 2000-0-04, Expires 7-31-86

|   |  |  |  |   |  |   |  |   |  |
|---|--|--|--|---|--|---|--|---|--|
| UNIFORM HAZARDOUS WASTE MANIFEST  |  | 1. Generator's US EPA ID No.<br>CA D 0 3 0 5 8 4 5 0 2 |  | Manifest Document No.                         |  | 2. Page 1 of 1                          |  | Information in the shaded areas is not required by Federal law. |  |
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC CO.<br>3601 E. LA PALMA<br>ANAHEIM, CA 92701 (714)630-4111  |  | 4. Generator's Phone                                   |  | 5. State Manifest Document Number<br>AR-75945 |  | 6. State Generator's ID<br>CAD030584502 |  |   |  |
| 5. Transporter 1 Company Name<br>CROWN TRANSPORT, INC., Memphis   |  | 6. US EPA ID Number<br>TN D 10 16 6 13 12 16 1 17 16   |  | 7. State Transporter's ID<br>H277 PC961       |  | 8. Transporter's Phone<br>800-328-4532  |  |   |  |
| 7. Transporter 2 Company Name   |  | 8. US EPA ID Number                                    |  | 9. State Transporter's ID                     |  | 10. Transporter's Phone                 |  |   |  |
| 9. Designated Facility Name and Site Address<br>ENSCO, INC.<br>American Road<br>El Dorado, AR 71730   |  | 10. US EPA ID Number<br>AR D 0 6 9 9 7 4 8 1 9 2       |  | 11. State Facility's ID<br>(501)863-7173      |  | 12. Facility's Phone                    |  |   |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers<br>No. Type                             |  | 13. Total Quantity                            |  | 14. Unit Wt/Vol                         |  | 15. Waste No.   |  |
| a. Waste Polychlorinated Biphenyls, UN2315<br>RQ 10/4.54 ORM-E  |  | 4 1 D M  |  |   |  | G                                       |  | PCB   |  |
| b.  |  |  |  |   |  |   |  |   |  |
| c.  |  |  |  |   |  |   |  |   |  |
| d.  |  |  |  |   |  |   |  |   |  |
| J. Additional Descriptions for Materials Listed Above<br>All Liquids over 600 ppm   |  | K. Handling Codes for Wastes Listed Above              |  |   |  |   |  |   |  |
| 15. Special Handling Instructions and Additional Information  |  |  |  |   |  |   |  |   |  |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment and Arkansas state regulations. |  |  |  |   |  |   |  |   |  |
| Printed/Typed Name<br>Sharon Morgan for LOUISE SAH  |  | Signature<br>Sharon Morgan for Louise Dahl             |  | Month<br>11                                   |  | Day<br>22                               |  | Year<br>85  |  |
| 17. Transporter 1 Acknowledgement of Receipt of Materials<br>Printed/Typed Name<br>Edward A. Rimmer   |  | Signature<br>Edward A. Rimmer                          |  | Month<br>11                                   |  | Day<br>12                               |  | Year<br>1985  |  |
| 18. Transporter 2 Acknowledgement of Receipt of Materials<br>Printed/Typed Name   |  | Signature  |  | Month   |  | Day                                     |  | Year  |  |
| 19. Discrepancy Indication Space<br>Replaces Manifest No. CA-84331433 with approval of ADPC&E and letter of authorization from Generator to follow.<br>Lee. @ Enscos: 21, 233 <sup>rd</sup>   |  |  |  |   |  |   |  |   |  |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19<br>Printed/Typed Name<br>Charles A. Cameron   |  | Signature<br>Charles A. Cameron                        |  | Month<br>11                                   |  | Day<br>12                               |  | Year<br>1985  |  |

EPA Form 8700-22 (Rev. 4-85) Previous edition is obsolete.

NOTICE: THE ORIGINAL AND NOT LESS THAN TWO (2) COPIES MUST MOVE WITH THE HAZARDOUS WASTE SHIPMENT. ONCE DELIVERED, THE TREATMENT STORAGE DISPOSAL FACILITY MUST RETURN THIS ORIGINAL COPY TO THE GENERATOR.

**ORIGINAL PAGE IS  
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State of California—Health and Welfare Agency

Department of Health Services  
Toxic Substances Control Division  
Sacramento, California

Use plain print or type. (Form designed for use on elite (12-pitch) typewriter.)

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|   |  |  |                                      |  |   |                     |
|---|--|--|--------------------------------------|--|---|---------------------|
| <b>UNIFORM HAZARDOUS WASTE MANIFEST</b>   |  | 1. Generator's US EPA ID No.<br><i>CAD030584502</i>    | Manifest Document No.<br><i>7401</i> | 2. Page 1 of 1   | Information in the shaded areas is not required by Federal law. |                     |
| 3. Generator's Name and Mailing Address<br><b>GENERAL ELECTRIC COMPANY</b><br>3601 E. LA PALMA AVENUE<br>ANAHEIM, CA 92806            |  |  |                                      | A. State Manifest Document Number<br><b>84718237</b>   |   |                     |
| 4. Generator's Phone (714) 630-4111   |  |  |                                      | B. State Generator's ID<br><b>CAD030584502</b>         |   |                     |
| 5. Transporter 1 Company Name<br><b>DART TRUCKING COMPANY</b>   |  | 6. US EPA ID Number<br><i>0 H D 0 0 93 5 5 8 2 5</i>   |                                      | C. State Transporter's ID<br><i>800723-835</i>         |   |                     |
| 7. Transporter 2 Company Name   |  | 8. US EPA ID Number                                    |                                      | D. Transporter's Phone<br><i>909-28-2347</i>           |   |                     |
| 9. Designated Facility Name and Site Address<br><b>ENVIROSAFE SERVICES OF IDAHO</b><br>10.5 MILES NW OF GRANDVIEW<br>GRANDVIEW, IDAHO |  | 10. US EPA ID Number<br><i>I D D 0 7 3 1 1 4 5 5 4</i> |                                      | E. State Transporter's ID                              |   |                     |
|   |  |  |                                      | F. Transporter's Phone                                 |   |                     |
|   |  |  |                                      | G. State Facility's ID<br><i>IDD073114654</i>          |   |                     |
|   |  |  |                                      | H. Facility's Phone<br><i>208/384-1500</i>             |   |                     |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  |  |                                      | 12. Containers No.                                     | 13. Total Quantity  | 14. Unit Wt/Vol     |
| a. WASTE POLYCHLORINATED BIPHENYLS, RQ10/4.54<br>ORM-E UN2315 (TRANSFORMERS)  |  |  |                                      | 0.02   | CM  | 2 1 1 0.0 P 261     |
| b. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315 (DEBRIS/SOLIDS)  |  |  |                                      | 0.15   | DM  | 0 2 7 0.0 P 261     |
| c. WASTE POLYCHLORINATED BIPHENYLS, RQ 10.4.54<br>ORM-E UN2315 (EMPTY)  |  |  |                                      | 0.02   | DM  | 0 0 1 0.4 P 261     |
| d. WASTE PAINT-RELATED MATERIAL (SOLID), FLAMMABLE LIQUID (FORMERLY) NA1263 (CRUSHED AEROSOL CANS)                                    |  |  |                                      | 0.04   | DM  | 0 0 4 0.0 P 512 251 |
| J. Additional Descriptions for Materials Listed Above<br>TRANSFORMERS DRAINED AND FLUSHED<br>AEROSOL CANS DRAINED AND CRUSHED         |  |  |                                      | K. Handling Codes for Wastes Listed Above<br><b>03</b> |   |                     |
| 5. Special Handling Instructions and Additional Information   |  |  |                                      |  |   |                     |

GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

|   |                                |                         |
|---|--------------------------------|-------------------------|
| Printed/Typed Name<br><i>Louise Sah</i>               | Signature<br><i>Louise Sah</i> | Date<br><i>10/23/84</i> |
| Transporter 1 Acknowledgement of Receipt of Materials |                                |                         |
| Printed/Typed Name                                    | Signature                      | Date                    |
| Transporter 2 Acknowledgement of Receipt of Materials |                                |                         |
| Printed/Typed Name<br><i>Lu Dale</i>                  | Signature<br><i>Lu Dale</i>    | Date<br><i>10/23/84</i> |
| Discrepancy Indication Space                          |                                |                         |

City Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in 19.

|  |                                 |                         |
|--|---------------------------------|-------------------------|
| Printed/Typed Name<br><i>BY EILTAI</i> | Signature<br><i>Mary Fitter</i> | Date<br><i>10/23/84</i> |
|--|---------------------------------|-------------------------|

1/84)

YELLOW TSD/ SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS

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CERTIFICATION

1015 LOUISIANA

LITTLE ROCK, AR 72202

(501) 375-8444

No.

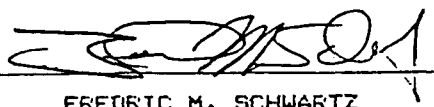
14318

CERTIFICATION OF COMPLIANCE AND DISPOSAL

LOUISE SAH  
G.E./JET PROPULSION LABS  
3601 EAST LA PALMA  
ANAHEIM CA 92085

ENSCO CERTIFIES THAT AS OF THE 30TH OF DECEMBER  
1985, ALL MATERIAL RECEIVED FROM G.E./JET PROPULSION LABS  
DESCRIBED ON ENSCO INVOICE NUMBER 36032, DATED 11/30/85,  
ENSCO RECEIVING REPORT NUMBER (DELIVERY TICKET NUMBER) Q1-3006  
AND MANIFEST NUMBER 75245, WAS DISPOSED OF IN COMPLIANCE  
WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS.

ENSCO INCORPORATED

BY   
NAME FREDRIC M. SCHWARTZ  
TITLE V.P. / SALES & MARKETING  
DATE 1/03/86

FORM NO. LR95114 (REV 7.84)



GENERAL ELECTRIC COMPANY  
 ANAHEIM DECOM FACILITY  
 PCB LOG REPORT  
 10/02/86  
 PAGE NO. 1

Job Numbers: 74126?  
 FSR Numbers: ALL  
 Customer Numbers: ALL

| ITEM NO.  | DESCRIPTION                           | WEIGHT LBS | DATE KGS      | DATE O/S | DISPOSAL RECEIVED | SHIPPED  | FACILITY  | LOCATION           | MANIFEST # | DATE BURNED |
|-----------|---------------------------------------|------------|---------------|----------|-------------------|----------|-----------|--------------------|------------|-------------|
| 74126A    | FSR NO: JET PROPULSION LABS           | PASADENA   | (818)577-9862 |          |                   |          |           | 84718271           |            |             |
| 001 LIQ   | <25K PCB CONT. SOLVENT                | 670        | 305           | 01/12/86 | 02/02/86          | 07/08/86 | US POLLUT | 84818676           |            |             |
| 002 S-DR  | <25K DERRIS, CONCRETE                 | 500        | 227           | 02/12/86 | 02/02/86          | 03/03/86 | ENVIROSAF | BOISE 84718237     | #####      |             |
| 003 S-DR  | <25K DERRIS, CONCRETE                 | 500        | 227           | 02/12/86 | 02/02/86          | 07/08/86 | ENVIROSAF | BOISE 84818978     | #####      |             |
| 004 S-DR  | <25K DERRIS, CONCRETE                 | 500        | 227           | 02/12/86 | 02/02/86          | 03/03/86 | ENVIROSAF | BOISE 84718237     | #####      |             |
| 005 S-DR  | <25K DERRIS, CONCRETE                 | 500        | 227           | 02/12/86 | 02/02/86          | 03/03/86 | ENVIROSAF | BOISE 84718237     | #####      |             |
| 006 S-DR  | <25K DERRIS, CONCRETE                 | 500        | 227           | 02/12/86 | 02/02/86          | 03/03/86 | ENVIROSAF | BOISE 84718237     | #####      |             |
| 007 S-DR  | <25K DERRIS                           | 102        | 46            | 02/12/86 | 02/02/86          | 07/29/86 | ENVIROSAF | BOISE 84818901     | #####      |             |
| 74126B    | FSR NO: JET PROPULSION LABS           | PASADENA   | (818)577-9862 |          |                   |          |           | 84718274           |            |             |
| 001 XFMR  | >25K WES 30 F 28 PXP17671             | 720        | 327           | 03/28/86 | 03/28/86          | 04/09/86 | ENVIROSAF | BOISE 84664640     | #####      |             |
| 002 CAP-B | >25K 57 CAPS IN BOXES                 | 1200       | 545           | 03/28/86 | 03/28/86          | 05/16/86 | ENSCO - C | EL DORADO AR-88009 |            |             |
| 003 CAP-B | >25K 57 CAPS IN BOXES                 | 1200       | 545           | 03/28/86 | 03/28/86          | 05/16/86 | ENSCO - C | EL DORADO AR-88009 |            |             |
| 004 CAP-B | >25K 57 CAPS IN BOXES IN 126B-02 & 03 | 0          | 0             | 03/28/86 | 03/28/86          | 05/16/86 | ENSCO - C | EL DORADO AR-88009 |            |             |
| 005 XFMR  | <500 WES 15 F 5 61M747                | 145        | 66            | 03/28/86 | 03/28/86          | 04/09/86 | ENVIROSAF | BOISE 84664640     | #####      |             |
| =====     |                                       |            |               |          |                   |          |           |                    |            |             |
| 6537 2971 |                                       |            |               |          |                   |          |           |                    |            |             |
| =====     |                                       |            |               |          |                   |          |           |                    |            |             |

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State of California—Health and Welfare Agency

Department of Health Services  
Toxic Substances Control Division  
Sacramento, California

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|   |  |   |                                      |                       |  |  |  |  |  |                                   |  |                 |  |
|---|--|---|--------------------------------------|-----------------------|--|--|--|--|--|-----------------------------------|--|-----------------|--|
| <b>UNIFORM HAZARDOUS WASTE MANIFEST</b>   |  | 1. Generator's US EPA ID No.<br>CA 78 000 20391 |                                      | Manifest Document No. |  | 2. Page 1 of 1                                 |  | Information in the shaded areas is not required by Federal law |  |                                   |  |                 |  |
| 3. Generator's Name and Mailing Address<br>JPL<br>4800 OAK GROVE BLVD. PASADENA, CA 91109   |  |   |                                      |                       |  | A.State Manifest Document Number<br>84718271   |  |  |  |                                   |  |                 |  |
| 4. Generator's Phone (818) 577-9862 GLEN KROLL  |  |   |                                      |                       |  | B.State Generator's ID<br>CA 78 000 20391      |  |  |  |                                   |  |                 |  |
| 5. Transporter 1 Company Name<br>GENERAL ELECTRIC CO  |  |   | 6. US EPA ID Number<br>CA 3030584502 |                       |  | C.State Transporter's ID<br>64952              |  |  |  |                                   |  |                 |  |
| 7. Transporter 2 Company Name   |  |   | 8. US EPA ID Number                  |                       |  | D.Transporter's Phone 714-630-4111             |  |  |  |                                   |  |                 |  |
| 9. Designated Facility Name and Site Address<br>GENERAL ELECTRIC CO<br>3601 LAPALMA BLVD., ANAHEIM, CA  |  |   |                                      |                       |  | E.State Transporter's ID                       |  |  |  |                                   |  |                 |  |
|   |  |   |                                      |                       |  | F.Transporter's Phone                          |  |  |  |                                   |  |                 |  |
| 10. US EPA ID Number<br>CA 3030584502   |  |   |                                      |                       |  | G.State Facility's ID<br>CA 3030584502         |  |  |  |                                   |  |                 |  |
|   |  |   |                                      |                       |  | H.Facility's Phone<br>714-630-4111             |  |  |  |                                   |  |                 |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  |   |                                      |                       |  | 12.Containers No.                              |  | 13. Total Quantity   |  | 14. Unit Wt/Vol                   |  | 15. Waste No.   |  |
| a.WASTE POLY CHLORINATED BIPHENYLS<br>ORM-E, UN 2315 LIQUID PCB   |  |   |                                      |                       |  | 1  |  | 50   |  | G                                 |  | 261             |  |
| b.WASTE POLY CHLORINATED BIPHENYLS<br>ORM-E, UN 2315 TRANSFORMER  |  |   |                                      |                       |  | 1  |  | 2000   |  | P                                 |  | 261             |  |
| c.WASTE POLY CHLORINATED BIPHENYLS<br>ORM-E, UN 2315 SOLIDIFIED SOLIDS  |  |   |                                      |                       |  | 5  |  | 2500   |  | P                                 |  | 261             |  |
| d.WASTE POLY CHLORINATED BIPHENYLS<br>ORM-E, UN 2315  |  |   |                                      |                       |  | 1  |  | 50   |  | P                                 |  | 261             |  |
| 16. Additional Descriptions for Materials Listed Above<br>TRANSFORMER S/N DXP 17671   |  |   |                                      |                       |  | K.Handling Codes for Wastes Listed Above<br>14 |  |  |  |                                   |  |                 |  |
| 15. Special Handling Instructions and Additional Information  |  |   |                                      |                       |  |  |  |  |  |                                   |  |                 |  |
| 18. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |   |                                      |                       |  |  |  |  |  |                                   |  |                 |  |
| Printed/Typed Name<br>WILLIAM A. NEESINGER  |  |   |                                      |                       |  |  |  |  |  | Signature<br>William A. Neesinger |  | Date<br>2/21/86 |  |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  |   |                                      |                       |  |  |  |  |  | Signature<br>J. L. Martin         |  | Date<br>6/21/86 |  |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  |   |                                      |                       |  |  |  |  |  | Signature                         |  | Date            |  |
| Printed/Typed Name  |  |   |                                      |                       |  |  |  |  |  | Signature                         |  | Date            |  |
| 19. Discrepancy Indication Space<br>MAILED TO / 3-31-86   |  |   |                                      |                       |  |  |  |  |  |                                   |  |                 |  |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |   |                                      |                       |  |  |  |  |  |                                   |  |                 |  |
| Printed/Typed Name  |  |   |                                      |                       |  |  |  |  |  | Signature<br>97                   |  | Date            |  |
|   |  |   |                                      |                       |  |  |  |  |  | Month Day Year                    |  |                 |  |

Please print or type. (Form designed for use on elite (12-pitch) typewriter)

| UNIFORM HAZARDOUS WASTE MANIFEST  |  | 1. Generator's US EPA ID No.<br>C A D 0 3 0 5 8 4 5 0 2 | Manifest Document No.<br>7 4 0 1 1 | 2. Page 1 of 1                                    | Information in the shaded areas is not required by Federal law. |
|---|--|---|------------------------------------|---|---|
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA AVENUE ANAHEIM, CA 92806  |  |   |                                    | A.State Manifest Document Number<br>84818876      |   |
| 4. Generator's Phone ( 714 ) 630-4111   |  |   |                                    | B.State Generator's ID<br>CAD030584502            |   |
| 5. Transporter 1 Company Name<br>DART TRUCKING COMPANY INC.   |  |   |                                    | C.State Transporter's ID                          |   |
| 6. US EPA ID Number<br>0 H D 0 0 9 8 6 5 8 2 5  |  |   |                                    | D.Transporter's Phone 800/238-8357                |   |
| 7. Transporter 2 Company Name   |  |   |                                    | E.State Transporter's ID                          |   |
| 8. US EPA ID Number   |  |   |                                    | F.Transporter's Phone                             |   |
| 9. Designated Facility Name and Site Address<br>U.S. POLLUTION CONTROL - GRAYBACK FIN CO<br>GRASSY MOUNTAIN FACILITY, 3 MICHIGAN EXIT 41<br>I-80, CLIVE, UTAH   |  |   |                                    | G.State Facility's ID<br>UTD991301748             |   |
| 10. US EPA ID Number<br>U T D 9 9 1 3 0 1 7 4 8   |  |   |                                    | H.Facility's Phone<br>801/266-3908 (801) 534-0054 |   |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  |   |                                    | 12. Containers<br>No. Type                        | 13. Total<br>Quantity   |
| a. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315 (LIQUIDS)  |  |   |                                    | 0 1 8 D.M.  | - 7 8 1 3 P   |
| b.  |  |   |                                    |   |   |
| c.  |  |   |                                    |   |   |
| d.  |  |   |                                    |   |   |
| J. Additional Descriptions for Materials Listed Above<br>ALL LIQUIDS UNDER 3000 PPM   |  |   |                                    | K.Handling Codes for Wastes Listed Above<br>99    |   |
| 15. Special Handling Instructions and Additional Information<br>ALTERNATE TSDF: RETURN TO GENERAOTR ALTERNATE EMERGENCY PHONE: LOUISE SAH 714/777-4376  |  |   |                                    |   |   |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |   |                                    |   |   |
| Printed/Typed Name<br>LOUISE SAH  |  | Signature<br><i>Louise Sah</i>                          |                                    | Date<br>Month Day Year<br>0 7   0 8   8 6         |   |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  | Signature<br><i>Coreta Pulley</i>                       |                                    | Date<br>Month Day Year<br>0 7   0 8   8 6         |   |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  | Signature   |                                    | Date  |   |
| Printed/Typed Name  |  | Signature   |                                    | Month Day Year                                    |   |
| 19. Discrepancy Indication Space  |  |   |                                    |   |   |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |   |                                    |   |   |
| Printed/Typed Name<br>STANLEY B. ISOM   |  | Signature<br><i>Stanley B. Isom</i>                     |                                    | Date<br>Month Day Year<br>0 7   0 8   8 6         |   |

DHS 8022 A (11/84)

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To: P.O. Box 3000, Sacramento, CA 95812MAN ID-182  
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| 1. Generator's Name and Mailing Address   |  | 2. Page 1 - Information in the shaded areas is not required by Federal law               |  |
|---|--|--|--|
| GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA AVENUE ANAHEIM, CA 92806<br>4. Generator's Phone (714) 630-4111  |  | A. State Manifest Document Number<br>84718237<br>B. State Generator's ID<br>CAD030504502 |  |
| 5. Transporter 1 Company Name<br>DART TRUCKING COMPANY  |  | 6. US EPA ID Number<br>10 H D 0 0 9 8 6 5 8 2 5  |  |
| 7. Transporter 2 Company Name   |  | 8. US EPA ID Number  |  |
| 9. Designated Facility Name and Site Address<br>ENVIROSAFE SERVICES OF IDAHO<br>10.5 MILES NW OF GRANDVIEW<br>GRANDVIEW, IDAHO  |  | 10. US EPA ID Number<br>I D D 0 7 3 1 1 4 6 5 4  |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers No. Type  |  |
| a. WASTE POLYCHLORINATED BIPHENYLS, RQ10/4.54<br>ORM-E UN2315 (TRANSFORMERS)  |  | 0 0 2 CM 2 1 1 0 0 P 261   |  |
| b. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315 (DEBRIS/SOLIDS)  |  | 0 15 DM 0 2 7 0 0 P 261  |  |
| c. WASTE POLYCHLORINATED BIPHENYLS, RQ 10.4.54<br>ORM-E UN2315 (EMPTY)  |  | 0 0 2 DM 0 0 1 0 4 P 261   |  |
| d. WASTE PAINT-RELATED MATERIAL (SOLID), FLAMMABLE<br>LIQUID (FORMERLY) NA1263 (CRUSHED AEROSOL CANS)   |  | 0 0 4 DM 0 0 4 0 0 P 512<br>281  |  |
| J. Additional Descriptions for Materials Listed Above<br>TRANSFORMERS DRAINED AND FLUSHED<br>AEROSOL CANS DRAINED AND CRUSHED   |  | K. Handling Codes for Wastes Listed Above<br>03  |  |
| 15. Special Handling Instructions and Additional Information  |  |  |  |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |  |  |
| Printed/Typed Name<br>Dorinda Louise Sak  |  | Signature<br>Dorinda Louise Sak  |  |
| Date<br>02/03/86  |  | Month Day Year   |  |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  |  |  |
| Printed/Typed Name<br>Dan Dale  |  | Signature<br>Dan Dale  |  |
| Date<br>02/03/86  |  | Month Day Year   |  |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  |  |  |
| Printed/Typed Name<br>Dan Dale  |  | Signature<br>Dan Dale  |  |
| Date<br>02/03/86  |  | Month Day Year   |  |
| 19. Discrepancy Indication Space  |  |  |  |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |  |  |
| Printed/Typed Name<br>MARY EULTAN   |  | Signature<br>Mary Eultan   |  |
| Date<br>02/03/86  |  | Month Day Year   |  |

HS 8022 A (11/84)  
EPA 8700-22)

YELLOW: TSDf SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS

84 856-1

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REG 0022 A (11/84)  
EPA 8700-22)

YELLOW TSDf SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS

B4 8964 Y

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1875 FORGE STREET  
TUCKER, GEORGIA 30084  
(404) 934-0902  
TELEX NO. 543-129

CERTIFICATION OF DECONTAMINATION

To GENERAL ELECTRIC SERVICES PPM Job Control No.: 1061019  
3601 LAPALMA  
ANAHEIM, CALIFORNIA

Decontamination Batch Number: GM003

This is to inform you that in accordance with 40 CFR 761.60 (e), and PPM, INC.'s authorization from the U.S. Environmental Protection Agency in Washington D.C., polychlorinated biphenyls (PCB) in oil from your company, as described below, were destroyed by PPM, INC./USPCI on November 24 1985 at its facility in CLIVE, Utah. Any inquiries should refer to the PPM job control number referenced above.

Generator Name

JET PROPULSION LABORATORY

Manifest Number

43450

Description of Material

4320 G. < 500 - 27 drums

Ending PCB Level

< 2 ppm

Sincerely,

PPM, INC.

By: 

10 CENTRAL AVENUE  
KANSAS CITY, KANSAS 66118  
(913) 621-4206  
TELEX NO. 434-607

P. O. BOX 8418  
PHILADELPHIA, PENNSYLVANIA 19101  
(215) 425-5144

TORONTO STAR BUILDING  
SUITE 801A  
ONE YONGE  
TORONTO, ONTARIO M5E-1E5  
(416) 364-1919  
TELEX NO. 065-242-00

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State of California—Health and Welfare Agency

Department of Health Services  
Toxic Substances Control Division  
Sacramento, California

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|   |  |   |  |                       |  |  |  |  |  |                  |  |                               |  |                         |  |
|---|--|---|--|-----------------------|--|--|--|--|--|------------------|--|-------------------------------|--|-------------------------|--|
| <b>UNIFORM HAZARDOUS WASTE MANIFEST</b>   |  | 1. Generator's US EPA ID No.<br><b>CA3700020391</b> |  | Manifest Document No. |  | 2. Page 1 of 1                                       |  | Information in the shaded areas is not required by Federal law |  |                  |  |                               |  |                         |  |
| 3. Generator's Name and Mailing Address<br><b>JET PROPULSION LABORATORY<br/>4200 OAK GROVE DRIVE<br/>PASADENA, CA 91109</b>   |  |   |  |                       |  | A. State Manifest Document Number<br><b>84043450</b> |  |  |  |                  |  |                               |  |                         |  |
| 4. Generator's Phone (818) 577-9231   |  |   |  |                       |  | B. State Generator's ID<br><b>CA3700020391</b>       |  |  |  |                  |  |                               |  |                         |  |
| 5. Transporter 1 Company Name<br><b>US POLLUTION CONTROL</b>  |  |   |  |                       |  | C. State Transporter's ID<br><b>68529</b>            |  |  |  |                  |  |                               |  |                         |  |
| 6. US EPA ID Number<br><b>TA1.001.047.4</b>   |  |   |  |                       |  | D. Transporter's Phone<br><b>(408) 528-8371</b>      |  |  |  |                  |  |                               |  |                         |  |
| 7. Transporter 2 Company Name   |  |   |  |                       |  | E. State Transporter's ID                            |  |  |  |                  |  |                               |  |                         |  |
| 8. US EPA ID Number   |  |   |  |                       |  | F. Transporter's Phone                               |  |  |  |                  |  |                               |  |                         |  |
| 9. Designated Facility Name and Site Address<br><b>US POLLUTION CONTROL<br/>GRASSY MOUNTAIN FACILITY<br/>3111 EAST 7TH NORTH EXIT 41 I-80<br/>CLIDE, UTAH</b>   |  |   |  |                       |  | G. State Facility's ID<br><b>GAJ980839187</b>        |  |  |  |                  |  |                               |  |                         |  |
| 10. US EPA ID Number  |  |   |  |                       |  | H. Facility's Phone                                  |  |  |  |                  |  |                               |  |                         |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  |   |  |                       |  | 12. Containers                                       |  | 13. Total Quantity   |  | 14. Unit Wt/Vol  |  | 15. Waste No.                 |  |                         |  |
| a. <b>MINERAL OIL, PCB CONTAMINATED LESS THAN 1000PPM WASTE POLYCHLORINATED BIPHENYLS ORME-RO UN2315</b>  |  |   |  |                       |  | No. <b>1</b>   |  | Type <b>TT</b>   |  | EST. <b>4500</b> |  | <b>G 261</b>                  |  |                         |  |
| b.  |  |   |  |                       |  |  |  |  |  |                  |  |                               |  |                         |  |
| c.  |  |   |  |                       |  |  |  |  |  |                  |  |                               |  |                         |  |
| d.  |  |   |  |                       |  |  |  |  |  |                  |  |                               |  |                         |  |
| J. Additional Descriptions for Materials Listed Above<br><b>FROM JPL GOLDSTONE FACILITY</b>   |  |   |  |                       |  | K. Handling Codes for Wastes Listed Above            |  |  |  |                  |  |                               |  |                         |  |
| 15. Special Handling Instructions and Additional Information<br><b>IN CASE OF SPILL - NOTIFY US CONTRACTORS - (800) 424-6302</b>  |  |   |  |                       |  |  |  |  |  |                  |  |                               |  |                         |  |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |   |  |                       |  |  |  |  |  |                  |  |                               |  |                         |  |
| Printed/Typed Name<br><b>GLEN KROLL</b>   |  |   |  |                       |  | Signature<br><i>Glen Kroll</i>                       |  |  |  |                  |  | Date<br><b>10/17/85</b>       |  |                         |  |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  |   |  |                       |  | Printed/Typed Name<br><b>RAY ANDIS</b>               |  |  |  |                  |  | Signature<br><i>Ray Andis</i> |  | Date<br><b>10/18/85</b> |  |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  |   |  |                       |  | Printed/Typed Name                                   |  |  |  |                  |  | Signature                     |  | Date                    |  |
| 3. Discrepancy Indication Space   |  |   |  |                       |  |  |  |  |  |                  |  |                               |  |                         |  |
| 23. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19   |  |   |  |                       |  |  |  |  |  |                  |  |                               |  |                         |  |
| Printed/Typed Name  |  |   |  |                       |  | Signature  |  |  |  |                  |  | Date<br>Month Day Year        |  |                         |  |





1875 FORGE STREET  
TUCKER, GEORGIA 30084  
(404) 934-0902

10 CENTRAL AVENUE  
KANSAS CITY, KANSAS 66118  
(913) 621-4206

RE: PPM Job Control Number 1061019  
and  
Hazardous Waste Manifest Number 43450

Dear Sir:

Enclosed, please find your copy of the above referenced hazardous waste manifest certifying that your shipment of PCB contaminated material has arrived at our Annex III facility in Clive, Utah.

If you have any questions concerning this shipment, please feel free to contact me in our Clive, office at 801-263-8168.

Sincerely,

PPM, INC.

A handwritten signature in cursive script that reads "Janice Shepherd".

Recordkeeping

Enclosure



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1875 FORGE STREET  
TUCKER, GEORGIA 30084  
(404) 934-0902  
TELEX NO. 543-129

CERTIFICATION OF DECONTAMINATION

To GENERAL ELECTRIC SERVICES PPM Job Control No.: 1061019  
3601 LAPALMA  
ANAHEIM, CALIFORNIA

Decontamination Batch Number: GM003

This is to inform you that in accordance with 40 CFR 761.60 (e), and PPM, INC.'s authorization from the U.S. Environmental Protection Agency in Washington D.C., polychlorinated biphenyls (PCB) in oil from your company, as described below, were destroyed by PPM, INC./USPCI on November 24 1985 at its facility in CLIVE, Utah. Any inquiries should refer to the PPM job control number referenced above.

Generator Name

Manifest Number

JET PROPULSION LABORATORY

43450

Description of Material

Ending PCB Level

4320 G. < 500 - 27 drums

< 2 ppm

Sincerely,

PPM, INC.

By: John F. Kent

10 CENTRAL AVENUE  
KANSAS CITY, KANSAS 66118  
(913) 621-4206  
TELEX NO. 434-607

P. O. BOX 8418  
PHILADELPHIA, PENNSYLVANIA 19101  
(215) 425-5144

TORONTO STAR BUILDING  
SUITE 801A  
ONE YONGE  
TORONTO, ONTARIO M5E-1E5  
(416) 364-1919  
TELEX NO. 065-242-00

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1875 FORGE STREET  
TUCKER, GEORGIA 30084  
(404) 934-0902

10 CENTRAL AVENUE  
KANSAS CITY, KANSAS 66118  
(913) 621-4206

CERTIFICATION OF DECONTAMINATION

To: Jet Propulsion Laboratory PPM Job Control No.: 1061019  
4800 Oak Grove Drive  
Pasadena, Ca. 91109

Decontamination Batch Number: 103

This is to inform you that in accordance with 40 CFR 761.60 (e), and PPM, INC.'s authorization from the U.S. Environmental Protection Agency in Washington D.C., polychlorinated biphenyls (PCB) in oil from your company, as described below, were destroyed by PPM, INC./USPOI on 11-24-8 1985 at its facility in Cedar, Utah. Any inquiries should refer to the PPM job control number referenced above.

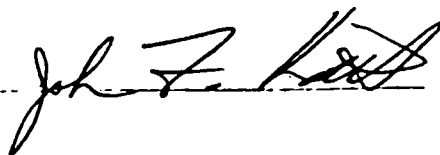
Generator Name  
Jet Propulsion Laboratory

Manifest Number  
43450

Description of Material:  
4320 g < 500 ppm

Ending PCB Level:  
< 2 ppm

For only,  
M. 1111



Serving Industry through Chemical Technology

PCB Management, Clean-Up, and Destruction



SAFETY OFFICE  
RECEIVED

JAN 16 1988

QPL

1875 FORGE STREET  
TUCKER, GEORGIA 30084  
(404) 934-0902

10 CENTRAL AVENUE  
KANSAS CITY, KANSAS 66118  
(913) 621-4206

# CERTIFICATION OF DECONTAMINATION

To: Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, Ca. 91109

PPM Job Control No.: 1061019

Decontamination Batch Number: 104

This is to inform you that in accordance with 40 CFR 761.60 (a), and PPM, INC.'s authorization from the U.S. Environmental Protection Agency in Washington D.C., polychlorinated biphenyls (PCB) in oil from your company, as described below, were destroyed by PPM, INC./USPCI on 12-24-07 1985 at its facility in Clive, Utah. Any inquiries should refer to the PPM job control number referenced above.

Generator Name  
Jet Propulsion Laboratory


Manifest Number  
43450

Description of Material  
756 g < 500 ppm

Ending PCB Level  
< 2 ppm

Sincerely,

PPM, INC.

Sr: 

Serving Industry through Chemical Technology

PCB Management, Clean-Up, and Destruction

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GENERAL ELECTRIC COMPANY  
 ANAHEIM DECOM FACILITY  
 PCB LIDS REPORT  
 10/21/86  
 PAGE NO. 1

Job Numbers: 74176  
 F.R. Numbers: ALL  
 Customer Numbers: ALL

| ITEM NO. | TYPE | FFM          | DATE     | WEIGHT LBS | DATE     | RECEIVED | SHIPPED  | DISPOSAL FACILITY | LOCATION          | MANIFEST # | DATE BURNED |
|----------|------|--------------|----------|------------|----------|----------|----------|-------------------|-------------------|------------|-------------|
| 74176    | FFM  | NO:          | 06/04/86 | 159        | 06/10/86 | 08/08/86 | 08/08/86 | GENERAL E         | HOUSTON 00-233485 |            |             |
| 001 LID  | 500  | CONT OIL     | 06/04/86 | 159        | 06/10/86 | 08/08/86 | 08/08/86 | GENERAL E         | HOUSTON 00-233485 |            |             |
| 002 LID  | 500  | CONT OIL     | 06/04/86 | 114        | 06/10/86 | 08/14/86 | 08/14/86 | ENVIRUSAF         | BOISE 84818H18    | 84818677   | *****       |
| 003 S-1R | 500  | RAGS/DRYSORB |          | 250        |          |          |          |                   |                   |            |             |
|          |      |              |          | 950        | 432      |          |          |                   |                   |            |             |

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| UNIFORM HAZARDOUS WASTE MANIFEST  |  | 1. Generator's US EPA ID No.<br>CAD 7000 20 291 | Manifest Document No. | 2. Page 1<br>1 of 1                             | Information in the shaded areas is not required by Federal law |              |
|---|--|---|-----------------------|---|--|--------------|
| 3. Generator's Name and Mailing Address<br>Jet Propulsion Laboratory<br>4000 Gakgrove Blvd., Pasadena, CA 91109   |  |   |                       | A. State Manifest Document Number<br>84818899   |  |              |
| 4. Generator's Phone (310) 577-9862 (Glen Kroll)  |  |   |                       | B. State Generator's ID                         |  |              |
| 5. Transporter 1 Company Name<br>General Electric Co.   |  | 6. US EPA ID Number<br>CAD 030584502            |                       | C. State Transporter's ID 703385                |  |              |
| 7. Transporter 2 Company Name   |  | 8. US EPA ID Number                             |                       | D. Transporter's Phone 714 630 4111             |  |              |
| 9. Designated Facility Name and Site Address<br>General Electric Co.<br>3001 La Palma Av. SE<br>ANAHEIM, CA   |  | 10. US EPA ID Number<br>CAD 030584502           |                       | E. State Transporter's ID                       |  |              |
|   |  |   |                       | F. Transporter's Phone                          |  |              |
|   |  |   |                       | G. State Facility's ID                          |  |              |
|   |  |   |                       | H. Facility's Phone<br>(714) 630 4111           |  |              |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers<br>No.                           | Type                  | 13. Total<br>Quantity                           | 14. Unit<br>Wt/Vol   | I. Waste No. |
| a. Waste Polychlorinated Biphenyls ORHE UN 2315<br>RQ 107   |  | 2   | DM                    | 80  | G  | 261          |
| b. Waste Polychlorinated Biphenyls ORHE UN-2315<br>RQ 107   |  | 1   | DM                    | 250   | P  | 261          |
| c.  |  |   |                       |   |  |              |
| d.  |  |   |                       |   |  |              |
| J. Additional Descriptions for Materials Listed Above<br>a. Liquid is below 500 ppm PCB<br>b. Solids are rags and dryorb with < 500 ppm PCB   |  |   |                       | K. Handling Codes for Wastes Listed Above<br>14 |  |              |
| 15. Special Handling Instructions and Additional Information  |  |   |                       |   |  |              |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |   |                       |   |  |              |
| Printed/Typed Name<br>M. A. GREGG   |  | Signature<br>M. A. Gregg                        |                       | Date<br>6/4/86                                  |  |              |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  | Signature                                       |                       | Date  |  |              |
| Printed/Typed Name<br>LORELL MARTIN   |  | Signature                                       |                       | Date<br>6/11/86                                 |  |              |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  | Signature                                       |                       | Date  |  |              |
| Printed/Typed Name  |  | Signature                                       |                       | Date  |  |              |
| 19. Discrepancy Indication Space  |  |   |                       |   |  |              |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |   |                       |   |  |              |
| Printed/Typed Name  |  | Signature                                       |                       | Date  |  |              |

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State of California—Health and Welfare Agency

Department of Health Services  
Toxic Substances Control Division  
Sacramento, California

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

| UNIFORM HAZARDOUS WASTE MANIFEST  |  | 1. Generator's US EPA ID No.                             | Manifest Document No. | 2. Page 1 of 1                                    | Information in the shaded areas is not required by Federal law. |  |
|---|--|--|-----------------------|---|---|--|
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA AVENUE ANAHEIM, CA 92805  |  | C A D 0 3 0 5 8 4 5 0 2 7 4 1 5 0                        |                       | A.State Manifest Document Number<br>84818818      |   |  |
| 4. Generator's Phone (714) 630-4111   |  | 6. US EPA ID Number<br>C A D 0 3 0 5 8 4 5 0 2 7 4 1 5 0 |                       | B.State Generator's ID<br>C A D 0 3 0 5 8 4 5 0 2 |   |  |
| 5. Transporter 1 Company Name<br>DART TRUCKING COMPANY, INC.  |  | 8. US EPA ID Number<br>D A R T 0 0 9 8 6 5 9 2 5         |                       | C.State Transporter's ID<br>710435                |   |  |
| 7. Transporter 2 Company Name   |  | 10. US EPA ID Number                                     |                       | D.Transporter's Phone<br>800/238-8357             |   |  |
| 9. Designated Facility Name and Site Address<br>ENVIROSAFE SERVICES OF IDAHO, INC.<br>10 1/2 MI N.W. GRANDVIEW<br>IDAHO 83624   |  | 12. Containers   |                       | E.State Transporter's ID                          |   |  |
|   |  | No. Type   |                       | F.Transporter's Phone                             |   |  |
|   |  | 13. Total Quantity                                       |                       | G.State Facility's ID                             |   |  |
|   |  | 14. Unit   |                       | H.Facility's Phone                                |   |  |
|   |  | Wt/Vol   |                       | I. Waste No.                                      |   |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  | 12. Containers   |                       | 13. Total Quantity                                |   |  |
| a. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315  |  | 0 2 7 C M  |                       | 29 0 4 5 P  |   |  |
| b. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315  |  | 0 02 D M   |                       | 0 0 2 9 9 P                                       |   |  |
| c.  |  |  |                       |   |   |  |
| d.  |  |  |                       |   |   |  |
| J. Additional Descriptions for Materials Listed Above<br>AL TRANSFORMERS HAVE BEEN DRAINED AND FLUSHED  |  | K. Handling Codes for Wastes Listed Above<br>3           |                       |   |   |  |
| 15. Special Handling Instructions and Additional Information<br>IN EMERGENCY CALL GENERAL ELECTRIC OR LOUISE SAH 714/777-4376 .   |  |  |                       |   |   |  |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |  |                       |   |   |  |
| Printed/Typed Name<br>LOUISE SAH  |  | Signature  |                       | Date<br>0 6 1 4 8 0                               |   |  |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  | Signature  |                       | Date<br>0 6 1 4 8 0                               |   |  |
| Printed/Typed Name  |  | Signature  |                       | Date<br>0 6 1 4 8 0                               |   |  |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  | Signature  |                       | Date<br>0 6 1 4 8 0                               |   |  |
| Printed/Typed Name<br>JIM PHILEY  |  | Signature  |                       | Date<br>0 6 1 4 8 0                               |   |  |
| 19. Discrepancy Indication Space  |  |  |                       |   |   |  |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |  |                       |   |   |  |
| Printed/Typed Name  |  | Signature  |                       | Date<br>0 6 1 4 8 0                               |   |  |





STATE OF ARKANSAS  
Department of Pollution Control and Ecology  
P. O. Box 9583 Little Rock, Arkansas 72219  
Telephone 501-562-7444

1

Please print or type. (Form designed for use on elite (12 pitch) typewriter.)

Form Approved. OMB No. 2000-0404 Expires 7-31-86

| UNIFORM HAZARDOUS WASTE MANIFEST   |  | 1. Generator's US EPA ID No.<br>C A I D 10 13 10 15 8 14 15 10 12 17 14 10 11 12 | Manifest Document No.                                | 2. Page 1 of 1     | Information in the shaded areas is not required by Federal law |               |
|--|--|--|--|--------------------|--|---------------|
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA AVENUE<br>ANAHEIM, CA 92806 714/630-4111   |  |  | A. State Manifest Document Number<br>AR-88012        |                    |  |               |
| 4. Generator's Phone   |  |  | B. State Generator's ID<br>CAD030584502              |                    |  |               |
| 5. Transporter 1 Company Name<br>DART TRUCKING COMPANY, INC.   |  |  | C. State Transporter's ID<br>0 H D 0 0 9 8 6 5 8 2 5 |                    |  |               |
| 6. Transporter 1 Phone   |  |  | D. Transporter's Phone<br>800/238-8357               |                    |  |               |
| 7. Transporter 2 Company Name  |  |  | E. State Transporter's ID                            |                    |  |               |
| 8. Transporter 2 Phone   |  |  | F. Transporter's Phone                               |                    |  |               |
| 9. Designated Facility Name and Site Address<br>ENSCO, INC.<br>AMERICAN ROAD<br>EL DORADO, AR 71730  |  |  | G. State Facility's ID<br>A R D 0 6 9 7 4 8 1 9 12   |                    |  |               |
| 10. Facility's Phone<br>501/863-7173   |  |  | H. Facility's Phone                                  |                    |  |               |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)   |  |  | 12. Containers<br>No. Type                           | 13. Total Quantity | 14. Unit Wt/Vol  | 15. Waste No. |
| a. WASTE POLYCHLORINATED BIPHENYLS, RQ 10/4.54<br>ORM-E UN2315 (LIQUIDS)   |  |  | 0 5 1 D M  | 0 2 5 5 0          | G  | PCB           |
| b.   |  |  |  |                    |  |               |
| c.   |  |  |  |                    |  |               |
| d.   |  |  |  |                    |  |               |
| J. Additional Descriptions for Materials Listed Above<br>BIXX ALL LIQUIDS OVER 500 PPM   |  |  | K. Handling Codes for Wastes Listed Above<br>PCB     |                    |  |               |
| if no alternate TSDF, return to generator  |  |  |  |                    |  |               |
| 15. Special Handling Instructions and Additional Information<br>DIKE AND CONTAIN IN THE EVENT OF SPILL<br>ALTERNATE/EMERGENCY PHONE: LOUISE SAH 714/777-4376   |  |  |  |                    |  |               |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and Arkansas state regulations<br>Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment |  |  |  |                    |  |               |
| Printed/Typed Name<br>LOUISE SAH   |  |  | Signature<br><i>Louise Sah</i>                       |                    | Month Day Year<br>06 24 86                                     |               |
| 17. Transporter 1 Acknowledgement of Receipt of Materials<br>Printed/Typed Name<br>FLOYD GIBSON  |  |  | Signature<br><i>Floyd Gibson</i>                     |                    | Month Day Year<br>06 24 86                                     |               |
| 18. Transporter 2 Acknowledgement of Receipt of Materials<br>Printed/Typed Name  |  |  | Signature  |                    | Month Day Year   |               |
| 19. Discrepancy Indication Space<br>Rec. @ Enco: 29,316 #  |  |  |  |                    |  |               |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19<br>Printed/Typed Name<br>SHARON MORGAN   |  |  |  |                    |  |               |
| Signature<br><i>Sharon Morgan</i>  |  |  | Month Day Year<br>10 6 2 86                          |                    |  |               |

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STATE OF ARKANSAS  
Department of Pollution Control and Ecology  
P. O. Box 9583 Little Rock, Arkansas 72219  
Telephone 501-562-7444

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Form Approved OMB No. 2000-0404 Expires 7-31-86

| UNIFORM HAZARDOUS WASTE MANIFEST   |  | 1. Generator's US EPA ID No.<br>CA D 0 3 0 5 8 4 5 0 2 | Manifest Document No.                            | 2. Page 1 of 1               | Information in the shaded areas is not required by Federal law |
|--|--|--|--|------------------------------|--|
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC CO.<br>3601 E. LA PALMA<br>ANAHEIM, CA (714)630-4111   |  |  | A. State Manifest Document Number<br>AR-75945    |                              |  |
| 4. Generator's Phone   |  |  | B. State Generator's ID<br>CAD030584502          |                              |  |
| 5. Transporter 1 Company Name<br>CROWN TRANSPORT, INC., Memphis  |  |  | C. State Transporter's ID<br>H277 PC961          |                              |  |
| 6. US EPA ID Number<br>TN D 10 16 16 13 12 16 11 17 16   |  |  | D. Transporter's Phone<br>800-328-4532           |                              |  |
| 7. Transporter 2 Company Name  |  |  | E. State Transporter's ID                        |                              |  |
| 8. US EPA ID Number  |  |  | F. Transporter's Phone                           |                              |  |
| 9. Designated Facility Name and Site Address<br>ENSCO, INC.<br>American Road<br>El Dorado, AR 71730  |  |  | G. State Facility's ID                           |                              |  |
| 10. US EPA ID Number<br>AR D 0 6 9 7 4 8 1 9 2   |  |  | H. Facility's Phone<br>(501)863-7173             |                              |  |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)   |  |  | 12. Containers<br>No. Type                       | 13. Total Quantity           | 14. Unit Wt/Vol Waste No.                                      |
| a. Waste Polychlorinated Biphenyls, UN2315<br>RQ 10/4.54 ORM-E   |  |  | 4 1 D M  |                              | G PCB  |
| b.   |  |  |  |                              |  |
| c.   |  |  |  |                              |  |
| d.   |  |  |  |                              |  |
| J. Additional Descriptions for Materials Listed Above<br>All Liquids over 600 ppm  |  |  | K. Handling Codes for Wastes Listed Above        |                              |  |
| 15. Special Handling Instructions and Additional Information   |  |  |  |                              |  |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.<br>Unless I am a small quantity generator who has been exempted by statute or regulation from the duty to make a waste minimization certification under Section 3002(b) of RCRA, I also certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and I have selected the method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment and Arkansas state regulations. |  |  |  |                              |  |
| Printed/Typed Name<br>Sharon Morgan for<br>LOUISE SAH  |  |  | Signature<br><i>Sharon Morgan for Louise Sah</i> |                              | Month Day Year<br>11 22 85                                     |
| 17. Transporter 1 Acknowledgement of Receipt of Materials<br>Printed/Typed Name<br>Edward A. Rinon   |  |  | Signature<br><i>Edward A. Rinon</i>              |                              | Month Day Year<br>11 12 10 15                                  |
| 18. Transporter 2 Acknowledgement of Receipt of Materials<br>Printed/Typed Name  |  |  | Signature  |                              | Month Day Year   |
| 19. Discrepancy Indication Space<br>Replaces Manifest No. CA-84331433 with approval of ADPC&E and letter of authorization from Generator to follow.<br>See @ Enco: 21,233#   |  |  |  |                              |  |
| 20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19<br>Printed/Typed Name<br>Gerald Cannon  |  |  |  |                              |  |
| Signature<br><i>Gerald Cannon</i>  |  |  |  | Month Day Year<br>11 12 1985 |  |

EPA Form 8700-22 (Rev. 4-85) Previous edition is obsolete.

NOTICE: THE ORIGINAL AND NOT LESS THAN TWO (2) COPIES MUST MOVE WITH THE HAZARDOUS WASTE SHIPMENT. ONCE DELIVERED, THE TREATMENT, STORAGE, DISPOSAL FACILITY MUST RETURN THIS ORIGINAL COPY TO THE GENERATOR.

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|   |  |   |  |                                  |   |  |                     |
|---|--|---|--|----------------------------------|---|--|---------------------|
| <b>UNIFORM HAZARDOUS WASTE MANIFEST</b>   |  | 1. Generator's US EPA ID No.<br>C A D 0 3 0 5 8 4 5 0 2 |  | Manifest Document No.<br>7 4 0 1 | 2. Page 1 of 1                                  | Information in the shaded areas is not required by Federal law |                     |
| 3. Generator's Name and Mailing Address<br>GENERAL ELECTRIC COMPANY<br>3601 E. LA PALMA ANAHEIM, CA 92806   |  |   |  |                                  | A. State Manifest Document Number<br>84885683   |  |                     |
| 4. Generator's Phone ( 714 ) 630-4111   |  |   |  |                                  | B. State Generator's ID<br>CAD030584502         |  |                     |
| 5. Transporter 1 Company Name<br>GENERAL ELECTRIC COMPANY   |  |   |  |                                  | C. State Transporter's ID<br>65433              |  |                     |
| 6. US EPA ID Number<br>C A D 0 3 0 5 8 4 5 0 2  |  |   |  |                                  | D. Transporter's Phone<br>714/530-4111          |  |                     |
| 7. Transporter 2 Company Name   |  |   |  |                                  | E. State Transporter's ID                       |  |                     |
| 8. US EPA ID Number   |  |   |  |                                  | F. Transporter's Phone                          |  |                     |
| 9. Designated Facility Name and Site Address<br>CHEMICAL WASTE MANAGEMENT, INC.<br>35251 OLD SKYLINE ROAD<br>KETTLEMAN CITY, CA 93239   |  |   |  |                                  | G. State Facility's ID<br>CAT000645117          |  |                     |
| 10. US EPA ID Number<br>C A T 0 0 0 6 4 5 1 1 7   |  |   |  |                                  | H. Facility's Phone<br>209/366-9711             |  |                     |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  |  |   |  |                                  | 12. Containers<br>No.                           | Type   | 13. Total Quantity  |
| a. WASTE POLYCHLORINATED BIPHENYLS, RO 10/4.5<br>ORH-E UN2315 (TRANSFORMERS)  |  |   |  |                                  | 0 1 4   | C M  | 8                   |
| b.  |  |   |  |                                  |   |  |                     |
| c.  |  |   |  |                                  |   |  |                     |
| d.  |  |   |  |                                  |   |  |                     |
| 14. Additional Descriptions for Materials Listed Above<br>TRANSFORMERS DRAINED AND FLUSHED  |  |   |  |                                  | K. Handling Codes for Wastes Listed Above<br>03 |  |                     |
| 15. Special Handling Instructions and Additional Information<br>EXTREMELY HAZARDOUS: HANDLE WITH COMMENSURATE CARE  |  |   |  |                                  | P.O. 051-74068-10                               |  |                     |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations. |  |   |  |                                  | Date<br>1 1 1 4 8 5                             |  |                     |
| Printed/Typed Name<br>LOUISE SAI  |  |   |  |                                  | Signature<br><i>Louise Sai</i>                  |  | Date<br>1 1 1 4 8 5 |
| 17. Transporter 1 Acknowledgement of Receipt of Materials   |  |   |  |                                  | Date  |  |                     |
| Printed/Typed Name<br>LARRY SMITH   |  |   |  |                                  | Signature<br><i>Larry Smith</i>                 |  | Month Day Year      |
| 18. Transporter 2 Acknowledgement of Receipt of Materials   |  |   |  |                                  | Date  |  |                     |
| Printed/Typed Name  |  |   |  |                                  | Signature                                       |  | Month Day Year      |
| 19. Discrepancy Indication Space  |  |   |  |                                  |   |  |                     |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.  |  |   |  |                                  | Date  |  |                     |
| Printed/Typed Name<br><i>S. J. Jones</i>  |  |   |  |                                  | Signature<br><i>S. J. Jones</i>                 |  | Month Day Year      |

**APPENDIX C**

**GENERAL ELECTRIC'S FINAL REPORT DETAILING PCB-ABATEMENT WORK  
DONE AT THE GOLDSTONE DEEP SPACE COMMUNICATIONS COMPLEX**

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PCB RETROFILL JOB  
JPL CONTRACT #957327  
SE JGS # 480E2574

| CONTRACT ITEM NO.                                   | C-3                     | B-1                 | C-3                     | B-1                 |
|---|-------------------------|---------------------|-------------------------|---------------------|
| SERIAL NUMBER                                       | F-965153 A<br>(TRANSF.) | F-965153 A<br>(OFD) | F-965153 B<br>(TRANSF.) | F-965153 B<br>(OFD) |
| LOCATION  | MOJAVE M23              | MOJAVE M23          | MOJAVE M23              | MOJAVE M23          |
| LIQUID/GALLONS                                      | 550                     | 3 & 3               | 550                     | 3 & 3               |
| DRAIN VALVE SIZE                                    | 1"                      | 1/4" PLUG           | 1"                      | 1/4" PLUG           |
| DATE DRAINED  | 10-9-85                 | 10-9-85             | 10-9-85                 | 10-9-85             |
| DRIP TIME/HRS                                       | 24                      | .5                  | 24                      | .5                  |
| FLUSHED/GALS  | 55                      | 1                   | 55                      | 1                   |
| REFILLED  | 10-10-85                | 10-9-85             | 10-10-85                | 10-9-85             |
| PCB CONTAMINATION/PPM<br>AS LISTED IN SPECIFICATION | 950                     | 622                 | 210                     | N/A                 |
| BEFORE RETROFILL                                    | 972                     | -----               | N/A                     | -----               |
| AFTER RETROFILL                                     | 18                      | 0                   | 19                      | 0                   |
| 90 DAYS AFTER RETROFILL                             | 15                      | 1.1                 | 4.7                     | 1                   |
| DATE RETESTED                                       | 2-5-86                  | 3-27-86             | 2-5-86                  | 3-27-86             |
| HIGHEST ACHIEVED TEMPERATURE                        | 38                      | N/A                 | 42                      | N/A                 |
| DIELECTRIC AFTER RETROFILL                          | 46.0 KV                 | -----               | 38.5 KV                 | -----               |

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PCB RETROFILL JOB  
JPL CONTRACT #957327  
GE JOB # 480E2594

|   |                       |             |             |             |
|---|-----------------------|-------------|-------------|-------------|
| CONTRACT ITEM NO.                                   | 8-1                   | 8-9         | 8-11        | 8-12        |
| SERIAL NUMBER                                       | COMM. BYPASS<br>(OFD) | PCV 8661-01 | PAV 8659-01 | PAV 8660-01 |
| LOCATION  | MOJAVE M23            | MOJAVE M23  | APOLLO      | APOLLO      |
| LIQUID/GALLONS                                      | 3 x 3                 | 290         | 277         | 226         |
| DRAIN VALVE SIZE                                    | 1/4" PLUG             | 1"          | 1"          | 1"          |
| DATE DRAINED  | 10-9-85               | 10-16-85    | 10-15-85    | 10-15-85    |
| DRIP TIME/HRS                                       | .5                    | 18          | 18          | 19          |
| FLUSHED/GALS  | 1                     | 30          | 30          | 20          |
| REFILLED  | 10-9-85               | 10-17-85    | 10-16-85    | 10-16-85    |
| PCB CONTAMINATION/PPM<br>AS LISTED IN SPECIFICATION | 631                   | 300         | 430         | 350         |
| BEFORE RETROFILL                                    | -----                 | 246         | 358         | 245         |
| AFTER RETROFILL                                     | 20                    | 0           | 0           | 0           |
| 90 DAYS AFTER RETROFILL                             | 1.3                   | 11          | 16          | 6.3         |
| DATE RETESTED                                       | 3-27-86               | 2-5-86      | 2-5-86      | 2-5-86      |
| HIGHEST ACHIEVED TEMPERATURE                        | N/A                   | 35          | 38          | 38          |
| DIELECTRIC AFTER RETROFILL                          | -----                 | 39.1 KV     | 36.0 KV     | 46.8 KV     |

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PCB RETROFILL JOB  
JPL CONTRACT #957327  
SE JOB # 480E2594

|   |          |           |          |          |
|---|----------|-----------|----------|----------|
| CONTRACT ITEM NO.                                   | C-6      | C-7       | C-2      | C-3      |
| SERIAL NUMBER                                       | G-856038 | E-698753  | 5365/T   | 5365/R   |
| LOCATION  | MARS     | MICROWAVE | VENUS    | VENUS    |
| LIQUID/GALLONS                                      | 250      | 145       | 350      | 350      |
| DRAIN VALVE SIZE                                    | 1"       | 1"        | 1"       | 1"       |
| DATE DRAINED  | 10-14-85 | 10-14-85  | 10- 8-85 | 10- 8-85 |
| DRIP TIME/HRS                                       | 1        | 1         | 48       | 48       |
| FLUSHED/GALS  | 25       | 20        | 50       | 50       |
| REFILLED  | 10-14-85 | 10-14-85  | 10-10-85 | 10-10-85 |
| PCB CONTAMINATION/PPM<br>AS LISTED IN SPECIFICATION | 210      | 210       | 645      | 530      |
| BEFORE RETROFILL                                    | 182      | 196       | 923      | 494      |
| AFTER RETROFILL                                     | 0        | .9        | 4.6      | 0        |
| 90 DAYS AFTER RETROFILL                             | 5.7      | 6.2       | 22       | 1        |
| DATE RETESTED                                       | 2-6-86   | 2-5-86    | 2-5-86   | 2-5-86   |
| HIGHEST ACHIEVED TEMPERATURE                        | 39       | 36        | 30       | 30       |
| DIELECTRIC AFTER RETROFILL                          | 36.0 KV  | 45.0 KV   | 42.0 KV  | 37.0 KV  |



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JPL CONTRACT #957327  
SE JCS # 480E2594

|   |            |            |                |                |
|---|------------|------------|----------------|----------------|
| CONTRACT ITEM NO.                                   | C-13       | C-10       | C-4            | C-19           |
| SERIAL NUMBER                                       | 70K246     | 62SK868    | F-814430       | F-525320-64F   |
| LOCATION  | MOJAVE M13 | MOJAVE M26 | MOJAVE BONEYD. | MOJAVE BONEYD. |
| LIQUID/GALLONS                                      | 150        | 50         | 435            | 300            |
| DRAIN VALVE SIZE                                    | 1"         | NONE       | 1"             | 1"             |
| DATE DRAINED  | 10-9-85    | 10-9-85    | 10-9-85        | 10-8-85        |
| DRIP TIME/HRS                                       | 48         | 120        | 144            | 168            |
| FLUSHED/GALS  | 20         | 10         | 30             | 20             |
| REFILLED  | 10-11-85   | 10-14-85   | 10-15-85       | 10-15-85       |
| PCB CONTAMINATION/PPM<br>AS LISTED IN SPECIFICATION | 150        | 75         | 550            | 285            |
| BEFORE RETROFILL                                    | 158        | 68         | 562            | 186            |
| AFTER RETROFILL                                     | 0          | 0          | 4.3            | N/A            |
| 90 DAYS AFTER RETROFILL                             | 3.1        | 1.5        | 9.4            | 2              |
| DATE RETESTED                                       | 2-5-86     | 2-5-86     | 2-5-86         | 2-5-86         |
| HIGHEST ACHIEVED TEMPERATURE                        | 60         | NO GAGE    | 29             | NO GAGE        |
| DIELECTRIC AFTER RETROFILL                          | 38.2 KV    | 38.0 KV    | 49.0 KV        | -----          |

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JPL CONTRACT #957327  
GE JOB # 480E2594

|   |                |                |                |                |
|---|----------------|----------------|----------------|----------------|
| CONTRACT ITEM NO.                                   | C-14           | C-5            | C-15           | C-16           |
| SERIAL NUMBER                                       | D-578002       | D-576342       | 5022836        | 5586347        |
| LOCATION  | MOJAVE BONEYD. | MOJAVE BONEYD. | MOJAVE BONEYD. | MOJAVE BONEYD. |
| LIQUID/GALLONS                                      | 150            | 160            | 77             | 100            |
| DRAIN VALVE SIZE                                    | 1"             | 1"             | NONE           | NONE           |
| DATE DRAINED  | 10-8-85        | 10-8-85        | 10-15-85       | 10-7-85        |
| DRIP TIME/HRS                                       | 192            | 192            | 4              | 216            |
| FLUSHED/GALS  | 15             | 15             | 15             | 15             |
| REFILLED  | 10-16-85       | 10-16-85       | 10-15-85       | 10-16-85       |
| PCB CONTAMINATION/PPM<br>AS LISTED IN SPECIFICATION | 84             | 510            | 250            | 120            |
| BEFORE RETROFILL                                    | 105            | 310            | 213            | 169            |
| AFTER RETROFILL                                     | 0              | 0              | 22             | 0              |
| 90 DAYS AFTER RETROFILL                             | 0              | 0              | 6.9            | 1.4            |
| DATE RETESTED                                       | 2-5-86         | 2-5-86         | 2-5-86         | 2-5-86         |
| HIGHEST ACHIEVED TEMPERATURE                        | NO GAGE        | NO GAGE        | NO GAGE        | NO GAGE        |
| DIELECTRIC AFTER RETROFILL                          | 40.3 KV        | 45.0 KV        | 49.8 KV        | 44.3 KV        |

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GOLDSTONE, CALIF.

PCB RETROFILL JOB  
JPL CONTRACT #957327  
SE JOB # 480E2594

|   |                |
|---|----------------|
| CONTRACT ITEM NO.                                   | C-17           |
| SERIAL NUMBER                                       | 66H5348        |
| LOCATION  | MOJAVE BONEYD. |
| LIQUID/GALLONS                                      | 100            |
| DRAIN VALVE SIZE                                    | NONE           |
| DATE DRAINED  | 10-7-85        |
| DRIP TIME/HRS                                       | 216            |
| FLUSHED/GALS  | 15             |
| REFILLED  | 10-16-85       |
| PCB CONTAMINATION/PPM<br>AS LISTED IN SPECIFICATION | 110            |
| BEFORE RETROFILL                                    | 172            |
| AFTER RETROFILL                                     | 0              |
| 90 DAYS AFTER RETROFILL                             | 2.1            |
| DATE RETESTED                                       | 2-5-86         |
| HIGHEST ACHIEVED TEMPERATURE                        | NO GAGE        |
| DIELECTRIC AFTER RETROFILL                          | 45.1 KV        |

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PCB RETROFILL JOB  
JPL CONTRACT # 957327  
SE JOB # 480E2594  
REVISION 2, 9-23-86

| EQUIPMENT                  | SERIAL NUMBER                                     | LOCATION   | VOLUME | PCB/PPM                         | CLASSIFICATION                                 |
|----------------------------|---|------------|--------|---------------------------------|--|
| SOCKET TANK                | 6087<br>(RETROFILLED AUG.86)<br>(RETESTED 2-5-86) | VENUS/653A | 10     | 61<br><br>0                     | PCB CONTAM.<br><br>NON-PCB                     |
| SOCKET TANK                | 5449  | VENUS/653A | 10     | 2.4                             | NON PCB  |
| SOCKET TANK                | 454301  | VENUS/653A | 10     | 47                              | NON PCB  |
| OIL FILTER PUMP            | NONE  | VENUS/653A | 10     | 19                              | NON PCB  |
| SOCKET TANK                | 5367  | VENUS/653A | EMPTY  |                                 |  |
| 55 GAL DRUM/M-50 SOLVENT   | N/A   | VENUS/653A | 20     | DISPOSED OF PER EPA REGULATIONS |  |
| HYDRAULIC RESERVOIR (WEST) | N/A   | VENUS/653A | 300    | 0                               | NON PCB  |
| HYDRAULIC RESERVOIR (EAST) | N/A   | VENUS/653A | 300    | 0                               | NON PCB  |
| 55 GAL DRUM/ OIL REMNANT   | N/A   | VENUS/663  | .5     | 86                              | PCB CONTAM.<br>DISPOSED OF PER EPA REGULATIONS |
| FILAMENT TRANSFORMER       | N/A<br>(RETROFILLED AUG.85)<br>(RETESTED 2-5-86)  | VENUS/663  | 2      | 61<br><br>2.1                   | PCB CONTAM.<br><br>NON-PCB                     |
| SOCKET TANK                | 6086<br>(RETROFILLED 2-6-86)<br>(RETESTED 9-4-86) | MARS/680   | 15     | 75<br><br>7.2                   | PCB CONTAM.<br><br>NON-PCB                     |
| SOCKET TANK                | K1-1045T  | MARS/680   | 15     | 0                               | NON PCB  |
| HENRY CHOKE                | N/A   | MARS/688   | 50     | .8                              | NON PCB  |
| 55 GAL DRUM (SOUTH)        | N/A   | ECHO/645   | N/A    | 16                              | NON PCB  |
| 55 GAL DRUM (NORTHEAST)    | N/A   | ECHO/645   | N/A    | 0                               | NON PCB  |
| 55 GAL DRUM (NORTH)        | N/A   | ECHO/645   | N/A    | 27                              | NON PCB  |
| 55 GAL DRUM (HYD. OIL)     | N/A   | VENUS BYD. | 20     | 0                               | NON PCB  |
| HENRY CHOKE                | N/A   | MARS BYD.  | 50     | 2.2                             | NON PCB  |

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JPL CONTRACT # 957327  
SE JOB # 480E2594  
REVISION 1, 9-23-86

| EQUIPMENT              | SERIAL NUMBER      | LOCATION            | VOLUME/GAL | PCB/PPM | CLASSIFICATION |
|------------------------|--------------------|---------------------|------------|---------|----------------|
| POWER SUPPLY           | 2511               | MOJAVE BONEYARD     | 200        | 4.4     | NON-PCB        |
| OFC ATS-UTIL           | NONE               | MOJAVE, M-24        | 6          | 31      | NON-PCB        |
| OFC ATS-TECH           | NONE               | MOJAVE, M-24        | 6          | 3.1     | NON-PCB        |
| OFC COLL TOWER         | NONE               | MOJAVE, M-20        | 2          | 66      | PCB CONTAM.    |
|                        | RETROFILLED 6-2-86 |                     |            | 0       | NON-PCB        |
|                        | RETESTED 9-4-86    |                     |            |         |                |
| CAPACITOR              | 8146               | VENUS BONEYARD      | 30         | 830100  | PCB UNIT       |
| HIPOTTER               | 1-3-212            | MARS, 60M ANTENNA   | 50         | 0       | NON-PCB        |
| ISOLATION TRANSFORMER  | #9                 | MARS, 60M ANTENNA   | 7          | 1.8     | NON-PCB        |
| ISOLATION TRANSFORMER  | #3                 | MARS, 60M ANTENNA   | 7          | 63      | PCB CONTAM.    |
|                        | RETROFILLED 6-3-86 |                     |            | 0       | NON-PCB        |
|                        | RETESTED 9-4-86    |                     |            |         |                |
| HIGH VOLT. SWITCH ASS. | #001               | MARS, 60M ANTENNA   | 16         | 69      | PCB CONTAM.    |
|                        | RETROFILLED 6-3-86 |                     |            | 3.5     | NON-PCB        |
|                        | RETESTED 9-4-86    |                     |            |         |                |
| FILAMENT TRANSF.       | #2983              | VENUS, 35 FT ANTENN | 3          | 125     | PCB CONTAM.    |
|                        | RETROFILLED 6-4-86 |                     |            | 14      | NON-PCB        |
|                        | RETESTED 9-4-86    |                     |            |         |                |
| FILAMENT TRANSF.       | SPARE              | VENUS BONEYARD      | 3          | 0       | NON-PCB        |
| HIPOTTER               | #636               | VENUS, 6-63         | 50         | 4.5     | NON-PCB        |
| HIPOTTER               | N/A                | VENUS, 6-63         | 100        | 2.8     | NON-PCB        |
| ISOLATION TRANSFORMER  | #7                 | VENUS               | 7          | 2.6     | NON-PCB        |
| ISOLATION TRANSFORMER  | #8                 | VENUS               | 7          | 9.1     | NON-PCB        |
| FILAMENT TRANSF.       | #2984              | VENUS, 10M ANTENNA  | 3          | 92      | PCB CONTAM.    |
|                        | RETROFILLED 6-3-86 |                     |            | 7.3     | NON-PCB        |
|                        | RETESTED 9-4-86    |                     |            |         |                |
| FILTER REACTOR         | B27689             | VENUS               | 41         | 25      | NON-PCB        |
|                        | RETROFILLED 6-4-86 |                     |            | 4.4     | NON-PCB        |
|                        | RETESTED 9-4-86    |                     |            |         |                |

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JET PROPULSION LABORATORY  
GOLDSTONE, CA

PCB RETROFILL JOB  
JPL CONTRACT #957327  
SE JOB 480E2594  
REVISION 1, 4-23-86

| EQUIPMENT                | SERIAL NUMBER | LOCATION             | VOLUME/GAL | PCB/PPM | CLASSIFICATION |
|--------------------------|---------------|----------------------|------------|---------|----------------|
| ISOLATION TRANSFORMER    | N/A           | MICRO WAVE           | 5          |         | NON-PCB        |
| HENRY CHOKE              | K-1093        | ECHO, G-45           | 100        | 0       | NON-PCB        |
| RECLOSER                 | N/A           | GOLDSTONE SUBSTATION | N/A        | 0       | NON-PCB        |
| OFC                      | N/A           | FT IRWIN WATER WELL  | 9          | 0       | NON-PCB        |
| DISTRIBUTION TRANSFORMER | N/A           | GOLDSTONE SUBSTATION | N/A        | 9.6     | NON-PCB        |
| CAPACITOR                | N/A           | ECHO, G-45           | 30         | 25      | NON-PCB        |
| HENRY CHOKE              | K-10314       | ECHO, G-53A          | 100        | 0       | NON-PCB        |
| ISOLATION TRANSFORMER    | #2            | ECHO, G-63           | 5          | 4.4     | NON-PCB        |

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| 16. Abstract<br><br><p>Six large parabolic dish antennas, at sites called Deep Space Stations, are located at the Goldstone Deep Space Communications Complex north of Barstow, California. Some of the ancillary electrical equipment at these Deep Space Stations, particularly transformers and power capacitors, were filled with stable, fire-retardant, dielectric fluids that contained substances called polychlorobiphenyls (PCBs).</p> <p>Because the Environmental Protection Agency has determined that PCBs are environmental pollutants toxic to humans, all NASA Centers have been asked to participate in a PCB-abatement program. Under supervision of JPL's Office of Telecommunications and Data Acquisition, a two-year long PCB-abatement program has eliminated PCBs from the Goldstone Complex.</p> <p>Thus, the Goldstone Deep Space Communications Complex is a major NASA facility that has abided by NASA guidelines and has eliminated the hazards of PCB contamination.</p> |  |  |           |
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